3 1761 06238304 7

The Library

OF

TRINITY MEDICAL SCHOOL.

No.

THE

PRINCIPLES AND PRACTICE

OF

MEDICINE;

FOUNDED ON THE MOST EXTENSIVE EXPERIENCE

IN

PUBLIC HOSPITALS AND PRIVATE PRACTICE;

AND DEVELOPED IN A

COURSE OF LECTURES,

DELIVERED AT

UNIVERSITY COLLEGE, LONDON;

BY

JOHN ELLIOTSON, M.D., CANTAB.; F.R.S.

PRESIDENT OF THE ROYAL MEDICAL AND CHIRURGICAL SOCIETY; PRESIDENT OF THE PHRENOLOGICAL SOCIETY; LATE PROFESSOR OF THE PRINCIPLES AND PRACTICE OF MEDICINE, AND OF CLINICAL MEDICINE, AND DEAN OF THE FACULTY OF MEDICINE, IN UNIVERSITY COLLEGE, LONDON; LATE SENIOR PHYSICIAN TO THE UNIVERSITY-COLLEGE-HOSPITAL; FELLOW OF THE ROYAL COLLEGE OF PHYSICIANS; FORMERLY PHYSICIAN TO ST. THOMAS'S HOSPITAL; AND PRESIDENT OF THE ROYAL MEDICAL SOCIETY OF EDINBURGH.

WITH NOTES AND ILLUSTRATIONS;

BY

NATHANIEL ROGERS, M.D.

MEMBER, AND LATE PRESIDENT, OF THE HUNTERIAN SOCIETY OF EDINBURGH; AND CORRESPONDING MEMBER OF THE MEDICO-CHIRURGICAL SOCIETY OF DUBLIN.

LONDON:

JOSEPH BUTLER,

MEDICAL BOOKSELLER AND PUBLISHER,

4, ST. THOMAS'S STREET, SOUTHWARK.

MDCCCXXXIX.

2/2/06

67491

PRINTED BY W. WILCOCKSON, ROLLS BUILDINGS, FETTER LANE.

PREFACE.

One of the most striking circumstances which have distinguished the Medical Literature of recent times, is the publication of the Lectures of various eminent Professors. Till within the last few years, hospital-theatres, as well as hospital-wards, were (except to the limited number of attendant pupils) as "a spring shut up," and "a fountain sealed." It would have been of the greatest advantage to medical men, and through them to the public at large, could these class-rooms have contained the whole profession. But what the architect could not do, the printer has done. He has given the Lecturer a voice, which penetrates as far as our language is known; and the results of his study and experience have been wafted, on the winds of heaven, to every quarter of the globe. Beginning with Sir Astley Cooper, the masters of our art, in brilliant succession, have thus been enabled to pour the accumulated treasures of their knowledge at our feet.

The name of Elliotson stands too high in the estimation of the Medical Profession, to require any apology for the publication of his Lectures;—replete, as they are, with sound practical information;—the result of long and extensive experience. There can be little doubt, therefore, that the present undertaking will be hailed with satisfaction; and that a due share of support and encouragement will be

awarded to the enterprising Publisher, for producing this work in a style commensurate with the valuable information it contains.

The duty of the Editor has been plain and direct; and he hopes the manner in which it has been performed, will meet the approval of the Profession. No liberties have been taken with the sense; which has, in every instance, been strictly adhered to. The alterations, numerous as they are, have been confined to the language; which has been carefully revised throughout. The repetitions and recapitulations incidental to vivâ voce delivery, have been expunged; the mistakes of the reporter have been corrected; long sentences have been broken up into more manageable masses; intricacies have been unravelled, and asperities smoothed; lengthy parentheses have been advanced to the dignity of independent sentences; and the greatest pains have been taken to convey information the most valuable, in language the most perspicuous. It is with much pleasure, and with full confidence as to the result, that the volume is now placed in the hands of the Profession.

N. ROGERS.

3, Sussex Terrace, Kentish Town;
February 1, 1839.

PRELIMINARY OBSERVATIONS.

THE Art of Medicine is to be perfected, I conceive, by improvements in our knowledge of the nature of diseases, by improvements in diagnosis, and by improvements in our acquaintance with remedies and their application.

Improvements in our knowledge of the nature of diseases, must be obtained through the cultivation of Anatomy and Physiology, and of Morbid Anatomy and Morbid Physiology; or, in other words, from an acquaintance with the derangements that take place in structure and function. It is evident that no one can be acquainted with a disease, unless he be acquainted, more or less, with the part diseased,—its situation, form, and structure; and the more accurate and minute his acquaintance with these particulars, the greater (cæteris paribus) will generally be his knowledge of the lesion. I say "cæteris paribus;" because a mere knowledge of Anatomy, however accurate and minute, does not imply a knowledge of disease,—its symptoms, history and causes,—or skill in treating it;—any more than a knowledge of the alphabet, and the ability to read, imply a literary character. Nothing can be more absurd than for the public to presume that a man is a good practitioner, merely because he is a good anatomist. An anatomist is not necessarily even a physiologist; and Mery was accustomed to say,—"We anatomists are like the porters of Paris; who are well acquainted with all its streets, as well as all its lanes and alleys; but who know nothing of what passes within the houses." The most assiduous examination of the dead body, can disclose but little of the functions and properties of a living one. The structure of the brain would never teach us that it is the

organ of thought and feeling; or the structure of the kidney that it produces a fluid containing lithic acid and urea. The sympathy existing between the nasal mucous membrane and the diaphragm, and between the kidneys and the skin; the curious phenomena resulting from contagions and malaria; the various morbid actions to which various parts are liable; the innumerable diseases of the nervous systems; the susceptibility of various parts to the operation of various agents during health;—such as of the mouth to the operation of mercury, and of the stomach to that of ipecacuanha; the peculiar power of certain substances over certain diseases;—as of quinine over intermittent fever; all this would never be suspected at the dissecting-table. And I cannot refrain from remarking, that for any one to pride himself on his knowledge of established anatomy, would be exceedingly weak; as it requires no preparatory philosophical education, and no intellectual exertion; but merely the possession of eyes and memory, and a willingness to employ them. Dr. Mc Culloch, in his recent powerful, though I must be pardoned in saying occasionally extravagant work, on Marsh-Fever and Neuralgia, apologizes for not arranging his cases anatomically; on the ground that it would have savoured of pedantry;—"a small pedantry," he says, "far too common; as if any man could not make himself master of Human Anatomy in a few weeks, as well as of any other tangible and demonstrable substances." But if it would be laughable for any one to pride himself on his knowledge of Anatomy, it is culpable in a physician not to be a good anatomist. In such a case he cannot comprehend the phenomena of many diseases. For example,—he cannot understand why, in partial paralysis of the head, sometimes only certain muscles cease to obey the will; why loss of sensation sometimes occurs alone, and why to only a certain extent; why the pain of neuralgia takes a particular course; or why, in disease of the heart, unusual varieties of sound and impulse are observable in particular portions of the cardiac region. He cannot possess any but the most superficial knowledge of Morbid Anatomy; the cultivation of the far greater part of which, is peculiarly the duty of the physician, who treats the chief morbid states of the most important organs of the body; and not of the surgeon, who does not even witness the symptoms; and he will, therefore, either neglect to complete the investigation of his unsuccessful cases, by examination after death; or he will be unable to appreciate what presents itself; and will perhaps be indebted to an active surgeon for information.

The importance of Physiology requires no argument in its sup-

port; for, except in obvious structural or mechanical changes, the symptoms of disease are chiefly Morbid Physiology. To quote the familiar passage of Galen,—"The magnitude of a disease is proportionate to its deviation from the natural state; and only he knows the extent of the deviation, who knows exactly what is the natural state." Without a thorough acquaintance with both the natural structure and the functions, a thousand highly interesting deviations will never be recognized in the cases which come daily before us.

If such be the importance of Anatomy and Physiology to every physician, the importance of perfecting these sciences to the progress of our knowledge of the nature of diseases, will not be disputed. But however necessary Anatomy and Physiology may be as foundations, the grand source of this knowledge is the observation of the phenomena of diseases,—their symptoms, history, and causes (in other words, Pathology); and of structural lesions (in other words, Morbid Anatomy). No one expresses a doubt respecting the importance of Pathology;—the importance of observing the symptoms, and tracing the history of diseases; and of investigating their peculiarities, analogies, and causes. Yet, in all this, how liable are we to error. How patient and searching an eye is required to note all the phenomena of a disease;—to perceive what is essential to a disease, and what is only incidental! How profound a judgment to reason upon these phenomena, and to investigate their causes;—to discern the analogies between affections which, at first sight, are perfectly distinct! And, at the same time, how *cool* should be the judgment duly to appreciate all fanciful analogies,—all hypothetical suggestions! Exactly the same difficulties surround Morbid Anatomy; but in its case they are alleged, by some, as objections to its prosecution. But how could any affection beneath the surface of the body have been understood, without an ocular investigation of the parts affected? How could pain in the chest, dyspnœa, cough, and pyrexia, have been known as signs of inflammation of the lungs or their membranes, unless the examination of persons who died under these symptoms, had proved such a lesion to be frequently their cause? If knowledge can be thus obtained, why not obtain the utmost degree of it possible? True it is that *incidental* morbid appearances, have often been mistaken as necessary or *constant*; and that some pretty constant appearances have often been absurdly announced as the *essence* of the disease, when they were merely its *effect*; or, at the utmost, only among the number of its phenomena. Equally true it is that changes after death have been

mistaken for morbid appearances; as was pointed out by Dr. John Davy, in the case of redness from the imbibition of blood. But such errors surely afford no reason for neglecting careful and extensive examinations of diseased parts; and drawing just inferences as to the connexion of the change of colour or structure with the disease;—they supply no reason for not cultivating so ample a field of knowledge scientifically. If a disease be accompaniad by a change of structure or appearance *within* the body, surely this change, as a fact in the disease, is worthy of notice; as worthy as *visible* changes of the skin, the mouth, or the eyes; which changes are always carefully described by these objectors, even when merely secondary effects; though they differ from the facts of Morbid Anatomy only in the accident of being cognisable without dissection; while they are not a whit more necessary to a perfect history of a disease, and are much less in number;—owing to the circumstance of nearly all our organs being concealed from view. After some diseases, indeed, no change of structure or appearance is discernible. But even here extensive anatomical investigation is important; for it often prevents us from forming groundless hypotheses, as to the seat and nature of such affections. Hydrophobia might be referred to the stomach, were it not that the red patches, which are sometimes seen in this organ after the disease, are frequently not to be detected. Tetanus might be thought always to arise from inflammation of the spinal marrow, were it not that this part is frequently found free from inflammation in tetanic patients. It discloses to us a fact which we might otherwise have doubted;—that diseases may be only functional, as well as structural;—that, in the words of one of the most intelligent and industrious cultivators of Morbid Anatomy and Pathology (Dr. Andral),—"it is one of the most serious errors to which the ill-directed study of Morbid Anatomy can lead, to admit no other alterations in the economy, than those which are discoverable by the scalpel." We learn, in short, to form a just estimate of Morbid Anatomy;—that it is an important *part* of the basis, but by no means the "*main* basis" of Pathology.

But if our art is to be perfected by a better acquaintance with the *nature* of diseases, it is not less to be perfected by improvements in *distinguishing* them;—by improvements in diagnosis. The diseases of the lungs and their membranes, are as well understood as any of the body; yet the best practitioners continually fail in distinguishing them. They often fail, for instance, to distinguish one form of chronic bronchitis from hydrothorax; the treatment of which diseases

may be totally different. So important is diagnosis, that it has become a proverbial saying,—"the knowledge of a disease is half the cure." Diagnosis is also to be improved, not only by a better acquaintance with the symptoms and history of diseases, but by a better acquaintance with Morbid Anatomy; so that the correspondence between symptoms and local lesions may be established, and the affection may thus be clearly ascertained. As healthy Anatomy is the foundation of Morbid Anatomy, and Physiology is the foundation of Pathology, the importance of these also to improvements in diagnosis, is apparent.

The discoveries made by Laennec with respect to diseases of the heart and lungs, are great enough to entitle him to all the honours which have ever been acquired in our profession. He has enabled us to judge of diseases which, by any other method than his own, are often not to be distinguished with certainty, or even not at all; and he has enabled us to do this with an accuracy, which is inconceivable to those who are unacquainted with his investigations. He has enabled us to distinguish diseases of the heart; which were formerly, and are still, too often either all expressed by the easy term,—"disease of the heart,"—without any specification of the particular part of this complicated organ affected; or are as often passed over entirely;—the case being mistaken for hydrothorax, or some pulmonary affection. He has also enabled us to distinguish diseases of the lungs which, in many cases, could not be pronounced upon with accuracy, and in others of which the diagnosis was always uncertain. Moreover he has enabled us to point out the very part affected.

But Laennec's discoveries are objected to, on the very ground of their accuracy. We are asked,—"cui bono?" The answer is plain. It is universally allowed that every disease should be described, and its nature ascertained, as accurately as possible. Now, with every advance in accuracy of description, and in knowledge of the source of symptoms, diagnosis imperceptibly and inevitably becomes more accurate. To condemn accurate *diagnosis*, therefore, is to condemn accurate *knowledge*. It is to rest satisfied with imperfect information, when industry would give us more. It is to admire ignorance, when knowledge is within our reach.

Besides, the art of diagnosis ought to be universally cultivated, without reference to its utility in particular instances. It is part of our science; and every part must be cultivated, with a view to the perfection of the whole; for what may not be practically useful to-

day, may become so to-morrow. How many discoveries in Chemistry and Natural Philosophy appeared, at first, to be objects of mere curiosity; though they have afterwards been applied to the most important purposes! Plato entertained so enobled a feeling for science on its own account, that he considered the applications of geometry to practical purposes, as far inferior to its philosophy; and those who may see no reason for being so deeply enamoured of science as that, must allow that there is every reason to remember the words of Jesus, the son of Sirach:—"None may say,—'what is this?—wherefore is this?'—for, at a time convenient, shall they be all sought out." In improving diagnosis, it is impossible to discover only what is obviously useful. The research must be made *generally*; and what is at once useful, and what is not, must turn up together. In the diseases of other organs, we always aim at accuracy of diagnosis, without any hope of utility. When a solid tumour exists in the abdomen, we endeavour to ascertain whether it is the liver, the spleen, the pylorus, an ovarium, a new formation, or something else; although the treatment would probably be the same for all.

But there *is* immediate utility in the discoveries of Avenbrugger and Laennec. No one will pretend that, in chronic diseases of the chest, —with the exception, perhaps, of phthisis,—the diagnosis is generally satisfactory. Before I adopted auscultation, I frequently discovered disease of the heart after death, where I had not previously suspected it; and frequently found the organ sound, when I had supposed it to be diseased. Even when I was correct in expecting to see an organic affection of the heart, I was often wrong as to the precise nature of the lesion. Too often has auscultation revealed to me disease of the heart, when, by good practitioners, no affection of the heart, or even of the chest, had been suspected; or where the case had been named "nervous palpitation," or "asthma;"—where the lungs had been regarded as the seat of the malady; or where the case had been treated with the most violent remedies for hydrothorax. Repeatedly have I seen chronic bronchitis, with extreme congestion of the lungs, mistaken for hydrothorax. This was unavoidable, when percussion and auscultation were omitted; because the symptoms were precisely the same, with the exception of those which percussion and auscultation could alone disclose. Inflammation of the substance of the lungs continually takes place during the course of other diseases, without being obvious, before death, to any but the auscultator and percussor. Without the aid of the ear, who can

ever distinguish emphysema of the lungs, or, in every case, pneumatothorax? Both may readily be mistaken for hydrothorax. The symptoms may be a pallid face, purple lips, orthopnœa, sudden starting from sleep to the waking state, a small and intermitting pulse, cold extremities, and swollen feet. The remedies of hydrothorax may appear indicated; but the ear will discover a hollow sound,—far *too* hollow a sound in the chest, at its very lowest parts; while there is, in the first case, very little respiratory murmur; and, in the second, none at all,—at the very place where the hollow sound is heard. Nothing but the ear can shew the nature of these cases. Nothing but the ear could distinguish them from each other. Without the ear, no case can be known with certainty to be one of hydrothorax, however marked the symptoms may be.

It has more than once happened to me, to be unable to form *any* opinion as to the nature of a disease, without auricular examination. Patients have complained of mere debility and loss of flesh, with slight general indisposition; and have declared themselves free from all local symptoms; so that nothing but the most random guesses could be made at their disease. A minute examination of them has discovered nothing wrong, or nothing *materially* wrong, in the performance of the functions of the head, chest, or abdomen; but, on percussing the chest, the sound, at some part, proved as dead as if the thigh had been struck; and, on applying the stethoscope, no respiration has been heard; or the voice has rushed through the instrument; or an unnatural sound has been heard in the heart; and thus the whole mystery has been at once cleared up. In truth, the exact state of the functions of the heart and lungs cannot be ascertained, except by the ear; and without an examination by its aid, no one is warranted in declaring those functions to be healthy. I once admitted a man into St. Thomas's Hospital, without any friend to give an account of him; and so deaf and stupid, that he could scarcely give any himself. He complained merely of occasional coldness, heat, and sweating; together with debility. He declared that he had been ill but two or three weeks; and ascribed his complaint to sleeping in a damp bed at Gravesend. The case resembled remittent fever, more than anything else; and I treated it with sulphate of quinine. The symptoms of remittent fever yielded; but the debility remained, and even increased. I investigated the case minutely. There were no symptoms of phthisis, or of any other local disease, except convexity of the nails. But, on striking the chest, I found the right superior part give a dead sound; and in the

centre of this I heard pectoriloquy. The case was then regarded as one of abundant tubercular deposition in the right lung, with an excavation in its centre; and the autopsy shewed that the diagnosis was correct. The diagnosis, it was clear, did not lead to a cure; but it prevented my plaguing the patient with medicines, from an erroneous idea of the nature and seat of the disease; and it enabled me to give a correct prognosis. Even when there can exist no doubt in the mind of an able practitioner, as to the seat and nature of the disease, auscultation may prove a useful aid. In consultation, another practitioner, from a peculiar bias towards the heart, may consider the symptoms to arise from that organ; although they are evidently pulmonic, and perhaps even phthisical; and *vice versâ*. Or perhaps he may refer unquestionable symptoms of organic pectoral disease of some kind or other, to the liver, or the digestive organs;—according to the reigning folly of the day. This is done, continually, with affections of the head and spine. It may be impossible clearly to refute him by the ordinary means of diagnosis; and yet auscultation may furnish symptoms of so decisive a nature as to silence him.

Auscultation, however, can never justify us in the least neglect of the general symptoms and history of a disease. This would indeed be unphilosophical; for the symptoms revealed by auscultation, are but one set among a number of others. But if it would be unphilosophical to neglect the general symptoms, it would be equally so to despise those which present themselves to the ear. If the functions of the heart and lungs are naturally performed with peculiar sounds, and if in diseases the sounds are altered, these deviations surely demand equal attention with those which are discernible by the other senses. Surely the physician requires all his senses for the acquisition of knowledge; as much as other prosecutors of natural science. We employ our eyes to discern the countenance, and general aspect of our patients; the changes of the pectoral, intestinal, and renal secretions; and alterations in the colour, size, and figure of various parts. We employ our touch to examine the pulse, and to ascertain the preternatural presence of fluid, preternatural enlargement, diminution, or induration. Our smell gives us information as to the depraved secretions of fever, as to suppuration, and as to gangrene. In the case of diabetes, some have even recourse to the sense of taste. Nay, certain symptoms observable by the ear only, are always carefully dwelt upon. Borborygmi, for instance, enter into the definition of hysteria; and all the varieties of cough and wheezing are described. Why then, should such sounds as are elicited by striking the chest,

or require the ear to be brought either into contact with it, or into connexion with it, by means of a solid medium, be despised? The celebrated Hook not only did not despise the ear, as an inlet of knowledge, but looked forward to the invention of acoustic instruments, which would enable it to make important discoveries. Indeed, he almost prophesied the stethoscope. "There may be a possibility," says he, "of discovering the internal motions and actions of bodies, by the sound they make. Who knows but that,—as, in a watch, we may hear the beating of the balance, and the running of the wheels, and the striking of the hammers, and the grating of the teeth, and multitudes of other noises,—who knows, I say, but that it may be possible to discover the motions of the internal parts of bodies (whether animal, vegetable, or mineral) by the sound they make;—that one may discover the works performed in the several offices and shops of a man's body; and may thereby discover what engine is out of order, what works are going on at several times, and be still at others; and the like.—I could proceed further; but methinks I could hardly forbear to blush, when I consider how the most part of men will look upon this. But yet, again, I have this encouragement;—not to think all these things utterly impossible; though never so much derided by the generality of men, and never so seemingly mad, foolish, and fantastic; and that, as the thinking them impossible cannot much improve my knowledge, so the believing them possible may perhaps be an occasion for taking notice of such things, as another would pass by without regard, as useless. And somewhat more of encouragement I have also from experience; that I have been able to hear, very plainly, the beating of a man's heart; and 'tis common to hear the motion of the wind, to and fro, in the guts and other small vessels. The stopping in the lungs is easily discovered by the wheezing.—As to the motion of the parts one amongst another,—in order to their becoming sensible they require, either that their motions be increased, or that the organ [of hearing] be made more nice and powerful, to sensate, and distinguish them as they are; for the doing of both which, I think it not impossible that, in many cases, there may be helps found."

Far be it from the defenders of auscultation and percussion to assert, that the diagnosis of thoracic diseases can never be doubtful. Skill in auscultation requires much application; and, even with the greatest, doubt will frequently exist. The stethoscope does not render the parietes of the chest transparent. Percussion and auscultation merely open a new set of symptoms to our notice; and, as

diagnosis is certain in proportion to the number and nature of the parts on which it is founded; and as the percussor and auscultator, with all the same means of judging as his opponents, possesses others in addition,—he is better qualified to form an opinion; and, though he may still sometimes regret his want of certainty, he knows that by shutting his ears,—by levelling himself with his opponents, he augments his uncertainty a hundred fold. Dr. Andral, who nowhere shews a disposition to overrate the nature of auscultation, and is a highly informed practical physician of the soundest judgment, says, in the preface to the second part of his "Clinique Medicale," —"Thanks especially to the wonderful discovery of Professor Laennec, the diagnosis of a great number of thoracic affections may frequently be established with as much accuracy, as that of the least complicated luxation, or the simplest fracture. There is a certain number of pneumonic inflammations, in which we are able to follow the different phases of alteration in the lungs, and of their return to the healthy state, with as strict precision as the eye follows the different periods of the cicatrization of an external wound. There are affections of the heart, in which the nature of the organic lesion may be determined, by the sense of hearing, almost as accurately as the state of a cutaneous tumour may be ascertained by the eye, or the state of the neck of the womb by the touch. Clinical observation, however, meets with many cases, in which diagnosis is obscure; and with others, in which the very nature of the affection is still a matter of dispute."

The alleged errors of those who practise auscultation, are no arguments against it. Many tales of this description, like those of the errors of phrenologists, have, when traced to their origin, proved inaccurate, or even altogether destitute of truth; and eagerly to catch at them would betray a mind that hopes no fresh knowledge is to be attained. Persons, it must be remembered, who have no skill, will pretend to it; and the skilful will sometimes give a hasty judgment. But, as in the case of Phrenology, nature is open to us all. Let us examine for ourselves;—examine carefully and patiently;—not anxious to find auscultation a deception;—but hoping to find the promise of new information fulfilled;—not unwilling to learn, because we are no longer *in statu pupillari*;—not so high in our own estimation, as to feel indisposed to be taught by others;—not unphilosiphical enough to have a hostile opinion, upon a matter which observation must decide;—not inconsistently lamenting the imperfection of our art, and whining about its sad claim to the title of "a conjectural

art;" while we are too indolent to investigate a method, which professes to remove much of its uncertainty; which is recommended by men of the greatest talent, and the most intense application to the study of their profession; which bears upon itself the stamp of probability; and the results of which, indeed, are capable of being proved physically inevitable. The greatest discoveries have generally been ridiculed at first; and their authors, no less than all the greatest benefactors of the human race, have been "despised and rejected of men." Let us remember that Harvey, whose memory *we* honour, was *dis*honoured at first by his cotemporaries, for the discovery which immortalized his name;—that he lost his practice; and, so far from finding comfort among his brethren, left the country, and was lampooned from one end of Europe to the other; and that no English physician who had attained the age of forty at that time, ever, to the end of his life, acknowledged the circulation of the blood. Let us remember that Sydenham, whose memory also *we* honour, was called a quack and a murderer by many of his cotemporaries; whose names, whatever bustle they made during life, have never once been mentioned since their death. Let us remember that the discovery of the lacteals was at first rejected with contempt;—that Bartholin, in a letter says,—"There is not one among the doctors of Montpellier, who acknowledges the lacteal vessels;—so wedded are they to the authority of Galen; for which they contend as though it was 'pro aris et focis;' and disregard the experiments of the moderns." Let us remember that even old Harvey, when the thoracic duct was afterwards discovered, could not at once loosen himself from the bonds of early prejudice, and give up the prevailing belief that the lacteals all terminated in the liver; and that the very Bartholin who saw the folly of the Montpellier doctors, never believed in the exclusive office of the thoracic duct. Let us remember that, if the illustrious father of our modern philosophy (Bacon) was not vilified and imprisoned, like Galileo, for announcing truth, he was represented by Cecil to Elizabeth (when she thought of making him her Solicitor-General) as "a man of mere speculation;"—as "one wholly given up to philosophical inquiries,—*new*, indeed, and *amusing*; but *fanciful* and *unsound*; and therefore more likely to distract her affairs, than to serve her carefully and with proper judgment." Finally, let us remember that, in ancient times, Horace saw his odes despised, because they were new!

I cannot forbear making the following extract from the first volume of Gall's work, on the Functions of the Brain.—"The

followers of the different schools of philosophy among the Greeks, accused each other of impiety and perjury. The people, in their turn, detested the philosophers; and accused those who investigated principles, with presumptuously encroaching on the rights of the Deity. The novelty of Pythagoras's opinions, caused his banishment from Athens; those of Anexagoras threw him into prison; the Abderites treated Democritus as a madman, because he dissected dead bodies, in order to discover the cause of Insanity; and Socrates, for demonstrating the unity of God, was condemned to drink hemlock. The same scandal has been renewed at all times, and among all nations. Many of those who, in the fourteenth century, distinguished themselves by their knowledge of natural things, were put to death as magicians. Galileo, for proving the motion of the earth, was imprisoned at the age of seventy. Those who first maintained the influence of climate upon the intellectual character of nations, were suspected of materialism. Universally, nature treats new truths and their discoveries in a singular but uniform manner. With what indignation and animosity have the greatest benefits been rejected! Look, for instance, at potatoes, Peruvian bark, and vaccination! As soon as Varolius made his anatomical discoveries, he was decried by Sylvius as the most infamous and ignorant madman. Varolius was reproached with dazzling his auditors by a seductive eloquence; and with artificially effecting the prolongation of the optic nerves, as far as the thalami. Harvey, for maintaining the circulation of the blood, was persecuted; and depravity went so far, as to attempt his ruin with James and Charles the First. When it was no longer possible to shorten the optic nerve, or to arrest the course of the blood in its vessels, the honour of these discoveries was, all at once, given to Hippocrates. The truths in Natural Philosophy announced by Linnæus, Buffon, the pious philosopher Bonnet, and George le Roy, were represented as impieties, likely to ruin religion and morality. Even the virtuous and generous Lavater was treated as a fatalist and a materialist. Everywhere do fatalism and materialism, placed before the sanctuary of truth, make the world retire. Everywhere do those upon whose judgment the public rely, not merely ascribe to the author of a discovery the absurdities of their own prejudices; but they even renounce established truths, if contrary to their purposes; and revive ancient errors, if calculated to ruin the man who is in their way. This is a faithful picture of what has happened to me. I have, therefore, some reason to be proud of having experienced the same lot as men to whom the world is

indebted for so great a mass of knowledge. It seems that nature has subjected all truths to persecution, in order to establish them the more firmly; for he who can snatch one from her, always presents a front of brass to the darts hurled against him, and has always force enough to defend and establish it. History shews us that all the efforts and sophisms which are directed against a truth once drawn from darkness, fall like dust blown by the winds against a rock! The instances of Aristotle and Descartes should particularly be quoted, when we wish to display the influence of prejudice upon the good or bad fortune of new doctrines. The opponents of Aristotle burnt his books. Afterwards, however, the books of Ramus, who had written against Aristotle, were burnt; the opponents of the philosopher of Stagira were declared heretics; and it was even forbidden by law to dispute his doctrines, under pain of being sent to the galleys. There is now no longer any discussion about the philosophy of Aristotle. Descartes was persecuted because he taught the innateness of ideas; and the University of Paris burnt his books. He had written the most sublime thoughts upon the existence of God; but Noel, his enemy, accused him of atheism. Afterwards the same University declared itself in favour of innate ideas; and when Locke and Condillac attacked innate ideas, the cry of 'materialism' and 'fatalism' resounded on all sides! Thus, the same opinions have, at one time, been regarded as dangerous because they were new; and, at another, as useful because they were ancient. We must, therefore, pity mankind; and must conclude that the opinion of cotemporaries, as to the truth or error, and innocent or dangerous tendencies of a doctrine, are very suspicious; and that the author of a discovery should be anxious only to ascertain whether he has really discovered a truth or not."

Gall might have added, in the words of Professor Playfair, that notwithstanding "the splendour of Newton's discoveries; the beauty, simplicity, and gradeur of the system they unfolded! and the demonstrative evidence by which that system was supported,—the Cartesian system of 'vortices' kept its ground for more than thirty years after the publication of those discoveries;" and that actually "the Newtonian philosophy first entered the University of Cambridge under the protection of the Cartesian!" This was effected by Dr. Samuel Clarke; who quietly explained the views of Newton, —without any appearance of argument or controversy,—in the form of notes to a new translation which he published of the French Cartesian work, long established as a text-book by the tutors of the

University. Dr. Chalmers, speaking of the first reception of the Newtonian philosophy, says that "authority scowled upon it; taste was disgusted by it; and fashion was ashamed of it."

With respect to the third mode in which I conceive that our art must be perfected (improvements in our knowledge of remedies, and their application) I must be brief. Much remains to be accomplished in the discovery, both of the virtues of medicines already in use, and of new medicines, or such modifications of old ones, as almost entitle them to the epithet "new." Every advance in our knowledge of the essential nature of diseases, will no doubt enable us to improve our application of remedies upon general principles;—to improve our "general indications." But without any additional knowledge of the nature of diseases, cautious trials,—guided by the best analogy we may discern, or by some fortuitous occurrence, will enable us (if we are disposed to labour) to effect much in extending our knowledge of the powers of particular remedies over particular diseases. Lord Bacon regrets that physicians apply themselves so exclusively to general indications;—neglecting the peculiar properties of remedies in particular diseases. Such experimental facts, however insulated they may at first appear, gradually arrange themselves, with others, into general principles; and thus what is, at first, little better than empiricism, becomes science. I confess that I look with more hope to this source of improvement, than to any other.—*Extracted, with some modifications, from Dr. Elliotson's Lumleyan Lectures on Diseases of the Heart.*

TO

HENRY, LORD BROUGHAM,

BARON BROUGHAM AND VAUX; F.R.S.; MEMBER OF THE NATIONAL INSTITUTE OF FRANCE;

THE ABLE, LIBERAL, AND ENLIGHTENED PROMOTER OF KNOWLEDGE IN ALL ITS DEPARTMENTS;

TO WHOM THE

LITERATURE OF THE COUNTRY IS INDEBTED FOR SOME OF ITS BRIGHTEST ORNAMENTS;

AND THE COUNTRY ITSELF FOR SOME OF ITS BEST LAWS;

WHOSE EXERTIONS THROUGH THE PRESS, AT THE BAR, AND IN THE SENATE, HAVE RAISED FOR HIM

"A MONUMENT MORE DURABLE THAN BRASS;"

WITH

PROFOUND ADMIRATION

OF HIS TRANSCENDENT TALENTS;

BUT STILL GREATER RESPECT FOR THEIR APPLICATION,

THIS VOLUME IS INSCRIBED,

BY HIS OBEDIENT SERVANT,

THE PUBLISHER.

CONTENTS.

	Page
Preface	v
Preliminary Observations	vii
Introduction	1
General Observations	11
Inflammation	60
Hæmorrhage	142
Profluvia	149
Dropsy	151
Deficient Secretions	162
Changes of Structure	162
Induration	163
Softening	164
Hypertrophy	167
Atrophy	170
Transformations	170
New Formations	176
Tubercles	177
Scirrhus	182
Cancer	183
Encephaloid Disease	185
Melanosis	188
Kirronosis	193
Anæmia	196
Chlorosis	197
Scurvy	199
Intermittent Fever	206
Continued Fever	259
Remittent Fever	318
Cutaneous Diseases	326
Papulæ	330
Lichen	334
Prurigo	337
Exanthemata	340

Page.
Roseola 341
Erythema 342
Urticaria 344
Rubeola 350
Scarlatina 358
Erysipelas 369
Squamæ 376
Pityriasis 377
Lepra 378
Psoriasis 380
Vesiculæ 383
Miliaria 383
Herpes 385
Eczema 387
Scabies 389
Pompholyx 391
Pustulæ 393
Impetigo 393
Ecthyma 396
Rupia 397
Porrigo 398
Variola 402
Vaccinia 413
Varicella 417
Acne 418
Sycosis 419
Boils 420
The Plague 421
Malignant Pustule 425
Glanders 426
Purpura 433
Discolorations of the Skin 435
Lupus 435
Cancer of the Skin 436
Elephantiasis 436
Icthyosis 437
Trichoma 439
Diseased Secretions of the Skin 440
Phrenitis 441
Acute Hydrocephalus 458
Spurious Hydrocephalus 465
Chronic Hydrocephalus 467
Convulsions 473
Spina Bifida 474
Delirium Tremens 475
Tetanus 479
Hydrophobia 489
Neuralgia 504

Page.
Paralysis Agitans 509
Chorea 511
Leaping Ague 516
Epilepsy 519
Hysteria 538
Catalepsy 545
Trance 547
Lethargy 548
Apoplexy 549
Paralysis 569
Hemiplegia 574
Paraplegia 581
Local Palsies 586
Amaurosis 586
Nyctalopia 587
Dysecæa 588
Anæsthesia 588
Paralysis of the Face 589
Paralysis of the Extremities 591
Tumours in the Brain 592
Hypertrophy of the Nerves 594
Atrophy of the Nerves 595
Malformations of the Nervous System . . . 595
Idiocy 599
Insanity 606
Bronchocele 643
Parotitis 651
Tonsillitis 653
Enlargement of the Tonsils 657
Fetid Breath 657
Pustules of the Mouth 658
Aphthæ 658
Ear-Ache 660
Pharyngitis 660
Stricture of the Œsophagus 661
Laryngitis 662
Aphonia 668
Croup 668
Organic Affections of the Larynx 672
Organic Affections of the Trachea 673
Catarrh 673
Influenza 676
Bronchitis 677
Dilatation of the Air-Tubes 690
Diminution of the Air-Tubes 693
Dilatation of the Air-Cells 694
Pneumonia 697
Gangrene of the Lungs 704

Page.
Hæmoptysis 707
Asthma 715
Hooping-Cough 732
Spasmodic Cough 737
Nervous Cough 738
Phthisis Pulmonalis 738
Pleuritis 765
Hydrothorax 776
Pneumato-Thorax 778
Hydro-Pneumato-Thorax 780
Tubercular Disease of the Pleura 784
Ossification of the Pleura 785
Pericarditis 786
Transformation of the Pericardium 792
New Formations in the Pericardium 793
Hæmorrhage into the Pericardium 793
Disease of the Lining Membrane of the Heart 793
Diseases of the Valves of the Heart 795
Carditis 816
Hypertrophy of the Heart 816
Dilatation of the Heart 816
Aneurism of the Heart 827
Induration of the Heart 829
Softening of the Heart 829
Abscess of the Heart 830
Ulceration of the Heart 830
Rupture of the Heart 831
Rupture of the Valves of the Heart 832
Gangrene of the Heart 833
Ossification of the Heart 833
Angina Pectoris 834
Atrophy of the Heart 835
Miscellaneous Diseases of the Heart 836
Aneurism of the Aorta 838
Peritonitis 842
Enlargement of the Mesenteric Glands 846
Ascites 847
Organic Diseases of the Peritoneum 850
Diseases of the Abdominal Glands 850
Cysts in the Abdomen 851
Dropsy of the Ovaries 851
Dropsy of the Fallopian Tubes 854
Tympanites 854
Diseases of the Pancreas 854
Pancreatic Calculi 855
Diseases of the Spleen 855
Miscellaneous Diseases of the Spleen 857
Hepatitis 857

Page.
Structural Diseases of the Liver - - - 861
Chronic Diseases of the Liver - - - 862
Gin-Liver - - - - - 863
Fatty Degeneration of the Liver - - - 863
Encephaloid Disease of the Liver - - - 864
Scrofula of the Liver - - - - 864
Scirrhus of the Liver - - - - 864
Melanosis of the Liver - - - 864
Hydatids in the Liver - - - - 865
Worms in the Liver - - - - 865
Jaundice - - - - - 866
Biliary Calculi - - - - 873
Diseases of the Gall-Bladder - - - 875
Diseases of the Stomach and Intestines - - 876
Gastritis - - - - - 884
Ulceration of the Stomach - - - 890
Rupture of the Stomach - - - - 890
Scirrhus of the Stomach - - - - 892
Calculi in the Stomach - - - - 894
Hæmatemesis - - - - 894
Enteritis - - - - - 896
Colic - - - - - 899
Paralysis from Lead - - - - 903
Intersusception - - - - 904
Dysentery - - - - - 905
Diarrhœa - - - - - 914
Discharge of Fat from the Bowels - - - 919
Gastro-Intestinal Concretions - - - 921
English Cholera - - - - 925
Epidemic Cholera - - - - 927
Disorders of the Digestive Organs - - - 936
Worms - - - - - 955
Nephritis - - - - - 967
Hæmaturia - - - - - 968
Organic Diseases of the Kidney - - - 971
Diseases of the Renal Capsules - - - 973
Functional Diseases of the Kidney - - 973
Ischuria - - - - - 974
Diabetes - - - - - 976
Excess of Urea in the Urine - - - 984
Serous Urine - - - - 985
Chylous Urine - - - - - 986
Discharge of Fat in the Urine - - - 986
Urinary Sediments - - - - 987
Urinary Calculi - - - - 992
Prostatic Calculi - - - - 995
Calculous Diatheses - - - - 995
Lithiasis - - - - - 1004

Page.
Cystitis - - - - - 1008
Cystorrhœa - - - - - 1008
Hypertrophy of the Bladder - - - 1009
Paralysis of the Bladder - - - - 1010
Disease of the Prostate - - - - - 1011
Gout - - - - - 1011
Rheumatism - - - - 1018
Concluding Address - - - - 1025
Appendix - - - - 1029
Synopsis of Cullen's Nosology - - - 1029
Coagulation of the Blood - - - 1040
Circulation of the Blood - - - - 1042
Physiological Classification of Diseases - - 1045
Synopsis of Cutaneous Diseases - - - 1051
Table of Poisons - - - - - 1055
Diseases of the Pericardium - - - - 1062
Healthy Sounds of the Heart - - - - 1066
Aneurism of the Heart - - - - 1069
Death of George the Second - - - 1071
Congestion of the Lungs - - - - 1072
Morbid Sounds of the Heart - - - 1073
Malignant Cholera at Edinburgh - - - 1078
Acupuncture - - - - - 1080
Index - - - - - 1082

THE

PRINCIPLES AND PRACTICE

OF

MEDICINE.

INTRODUCTION.

From the want of a University, Medicine and Surgery were, for a long time, scarcely taught in London at all, notwithstanding the ample means presented by the population and the hospitals. The student was compelled to travel to France, Holland, or Italy, or, in later times, to Germany or Scotland, for the purpose of acquiring a true professional education; our own two Universities neglecting almost entirely to teach Medicine;—whether from the want of anatomical and clinical means, the hopelessness of rivalling the great continental and Scottish schools, or the idea that their proper end was to teach general knowledge,—to impart only what all educated persons should know; or from the circumstances mentioned in a powerful and remarkable article, in the 108th number of the Edinburgh Review, upon the Universities of England:—The Ascendancy of the Colleges over the University;—the subversion of the professorial system by the tutorial. Time was (says the reviewer) when the Colleges did not exist, and the University was there; and were the Colleges again abolished, the University would remain entire. When the University was paramount, the cycle of instruction was distributed among a body of teachers, all professedly chosen from merit, and each concentrating all his ability on a single object; and the whole youth of equal standing in the University, daily collected into large classes under the same professor; whereas the colleges and halls are now elevated into so many little universities; into which the students are distributed (with little regard to ability or standing) among some fifty tutors, who are chosen from the fellows; notwithstanding that the fellowships were not founded for the purposes of teaching, and that the fellow rarely owes his eligibility to merit alone, but also, in the majority of cases, to some fortuitous circumstances.

The opportunities of teaching Anatomy, Surgery, and Medicine,

in London, however, became at length too great to be entirely thrown away; and the surgeons of the hospitals began to deliver lectures on Anatomy and Surgery, and afterwards the physicians upon Medicine. These lectures were of limited extent; nor were systems of courses, for a time, delivered so as to constitute regular schools. The time, the trouble, and the expense of travelling to a University of medical reputation, rendered the emolument fairly to be expected on establishment in practice too high for the mass of the people to afford; and as population increased, and more practitioners were demanded, home medical instruction was sought after by greater numbers every year;—and this the more, as any one could practise without the license or authority of any University.

The lectures improved, and at length regular schools were established; yet, as they were all private, and could confer no privileges or honours, those who required degrees went to the old celebrated schools; while those whose only resource was the private schools, had too limited pecuniary means to devote much above a year to public study; so that these metropolitan schools remained scanty and superficial. The whole of Anatomy and Physiology, and Morbid Anatomy together, were disposed of in a course of little more than three months; the Practice of Medicine, and the science of Chemistry, each in the same period, with only a lecture of one hour's duration three times a week. Much of General Pathology, and Forensic Medicine, was altogether omitted; and the whole of Medical Police, and the literature of the profession, were passed over. Things remain still in the same state, except that courses on Forensic Medicine are now about to be delivered.* It was left for this University† to be bold enough to establish courses of six months' duration; in which full scope would be afforded to the professors of laying before the student the whole body of medical science; to add the charms of varied illustration; to inculcate important points earnestly and repeatedly; and to introduce the student to an acquaintance with medical literature.

The mode of instruction by lecture, though by no means sufficient of itself, is in my mind of high importance. When a whole subject can be taught in a solitary course of lectures, and the exhibition of nothing is required, so that a mere delivery of statement constitutes the whole task of the professor, there can be no doubt that a good work, containing all the same information, might be studied in private with equal benefit; and, indeed, with this greater advantage;—that it would probably, after costing less, remain in the possession of the student, to be consulted by him whenever he might think fit. But when a circle of instruction is required;—when the subjects are numerous, and demand many courses of lectures, and many professors, the student cannot be committed to himself. Without lectures he would become almost to a certainty bewildered, studying at irre-

* These observations were made at the commencement of the session 1831-2.

† The University of London; or, as it is now called, University College.

gular intervals, wandering from one subject to another, and getting little fruit from any; whereas the attendance on various lectures, at stated hours, creates an excitement and an interest, as well as a regularity of habit, which are of incalculable utility.

In our science and art, however, lectures are, on another account, of superior advantage,—indeed indispensable. One part of the office of every medical lecturer, is to describe objects of sense. The attempt to learn Anatomy, Physiology, Chemistry, Materia Medica, or Botany, would be ridiculous, without the inspection of the material objects, and the principal phenomena. Of the Practice of Medicine and the Practice of Surgery, the same is true. The professor neither of the one, nor of the other, can give his pupils a full idea of the phenomena of diseases, or of the administration of remedial means, without patients exhibiting the various phenomena of disease, and subjected to the exercise of our art. As cases, however, cannot be had at pleasure, so as regularly to illustrate a systematic course of lectures, it is indispensable to deliver the general description and history of diseases and their treatment, in a distinct course; and to afford the illustrations from life in a totally separate manner, as they incidentally present themselves in a collection of patients. It is indispensable that there should be both a general course, and clinical instruction. Yet, in the general course, material illustration is both possible and necessary. Representations of the various morbid changes (by copious and well-executed drawings, engravings, and models), and actual specimens of these changes, and all the material products of disease, it is the duty of a teacher to present and explain; although, when I was a student in Edinburgh, the professor of Medicine never exhibited a single drawing, or a morbid specimen. In these respects the University of London affords me great advantages. The museum is excellent; and with the assistance of the profession, may become unrivalled. And here I intreat the profession to contribute to it;—to preserve what morbid specimens they can, and deposit them with us; remembering that we have no hospital to supply us, and must depend entirely upon individual contribution; remembering, likewise, that our museum is of far greater utility, than any others unconnected with a school;—that, while those are open only to the inspection of the profession, not merely is this open to the profession, but every preparation in it is laid distinctly before the students, and employed by the professors as a means of instruction: I therefore intreat the practitioners of this vast metropolis to render it, as they readily can, and at no expense, one of the first pathological museums in Europe. The drawings possessed by the University are, I believe, unrivalled;—at least I have no where else seen such a collection. Their accuracy and beauty, their scale, and their numbers, are the admiration of all who have seen them; and reflect such credit upon Dr. Carswell, that he requires no panegyric of mine; and when the short period in which they were executed is considered, his industry becomes equally a subject of admiration with his talents.

In the other great mode of instruction in the Practice of Medicine and Surgery, the University fails; and our school can never deserve the name of a great medical school while the defect exists:—a hospital is imperiously necessary. It is true that we have a dispensary; but a dispensary must always be a miserable substitute to the student for a hospital. No medical University would grant the degree of Doctor in Medicine, to any who had frequented merely a dispensary. At a dispensary the majority of patients are so little indisposed, as to be able to go about. When seen, they necessarily pass in rapid review before the practitioner; giving him an opportunity of showing how practice may be dispatched, rather than how disease should be investigated: for, if the time demanded for the scientific and patient investigation of each case, and for demonstration and explanation to the pupil, were given, the poor creatures would be compelled to lose, in attending at the charity, far more time than their condition in life or their strength would allow. There is, besides, no certainty among the patients of a dispensary, that medicine is regularly taken;—no possibility of fixing their diet;—no certainty of their continuing to attend, so that each case may be regularly followed up to its conclusion;—no possibility of making daily observations. When cases are severe, and the patients confined at home, there is not only the same uncertainty of strict attention to the injunctions respecting medicines and diet, but the student must lose a great deal of time in running from one house to another; and the physician or surgeon will not visit all such patients daily with his pupils; and, indeed, his pupils cannot accompany him in these visits, with any degree of regularity. In an hospital the patients are compelled to obey every injunction; and being under the same roof, they may be seen at pleasure any hour of the day, without loss of time; so that long and repeated observation of their cases is easy. When death occurs to a dispensary patient, and an examination is permitted, the student loses still more time; for he not only must go to the house of the family, but prepare the body, and afterwards reinstate it; and, in all probability, will seldom be accompanied by the physician or surgeon. At hospitals the examination takes place without any loss of time; the student has no where to go; servants prepare, and sew up, and wash the body; and the physician or surgeon usually superintends the inspection. So superior are the advantages of hospitals, that, as I have already remarked, certificates of attendance upon them are required at all medical Universities, previously to examination for the doctorate; and although certificates of attendance at dispensaries are admitted by the Apothecaries' Company of London, and may be obtained at a cheaper rate than those of hospitals, the majority of English medical students voluntarily enter themselves to the medical practice of hospitals. The inferiority of dispensaries is, indeed, acknowledged by their medical officers, in the greater cheapness of their terms; and the Apothecaries' Company declare it, in their demand of a longer attendance at them than at hospitals. It is, therefore, much to be

lamented that the Apothecaries' Company admit dispensary attendance at all; for if, of the short period enjoyed by the medical pupil for the public study of his profession, a certain portion is necessarily devoted to witnessing cases, that portion should evidently be spent in witnessing them in what is acknowledged to be the most efficient manner; and if eighteen months can be spared for witnessing *dispensary* practice, they can be spared for witnessing *hospital* practice. Those who cannot see the necessity of hospital attendance,—for the purpose of witnessing, without any loss of time, the most important diseases, and their minute investigation, and accurate and unrestrained treatment by the physician,—cannot but admit the necessity of hospital attendance for the purpose of witnessing the great accidents, and operations of surgery. The College of Surgeons can receive no certificates of attendance upon the surgical practice of dispensaries. If, therefore, the student must attend a hospital for half his experience, it is indisputably best that he should acquire the other half within the same walls. In uttering these, my sincere convictions, I feel some delicacy, because I am a hospital physician. But those who know me will, I am sure, acquit me of any interested motive; and, in truth, the medical clinic of St. Thomas's is frequented to the utmost of our desire; and I am not likely to have it in my power very long to remain attached to that great Institution. I will not scruple to add, that I think the student pays too much for hospital attendance in London; that the entrance should not be to medical or surgical practice alone, but to the whole range of the hospital; and that the sum which is paid to witness the surgical practice only, would be a sufficient remuneration for the surgeons and physicians together; and I should rejoice to see the most meritorious among the senior students, rewarded gratuitously with the appointments of dressers to the surgeons, as well as of clinical assistants to the physicians. The last argument I will urge in favour of hospitals is, that they are also dispensaries. They have a dispensary department, in which patients are attended to the same amount as at mere dispensaries. Besides all the inmates of St. Thomas's, the greater part of ten thousand out-patients are attended; and, although none are visited at home, this might readily be done without any farther trouble or expense, by the senior and best-informed students; to whom such a trust would be an incalculable benefit.

It is thus certain that the pupils of this University, must frequent hospitals for the purposes of Surgery; and that many will frequent them also—and I think all ought to frequent them—for the purposes of Physic; that they must be indebted to other practitioners than the professors,—to others who are unconnected with the University, and possibly are lecturers in other schools,—for a most important part of their education; and that this cannot be celebrated as a medical school,—that it cannot be said to afford a perfect medical education, till it possesses a hospital. Without a hospital, the professors, it must be added, who teach the practical part of the profession, not only are deprived of the means of properly instructing

their pupils, but lose the great advantage of proving to them the truth of their statements, and the propriety of their precepts. One great source of my pleasure in teaching at St. Thomas's Hospital, was the opportunity of shewing the pupils that I practised what I inculcated;—of rendering probable, or even proving to them, that what I advanced was true; and of referring from time to time, for illustrations of my descriptions, to cases which they had witnessed with me in the institution.

For the greater part of these important objects, a small hospital would be sufficient;—a hundred medical, and a hundred surgical beds. This number of well-selected cases, assiduously studied, would answer all ordinary purposes, as well as the 458 beds of St. Thomas's; one half of the cases in which are imperfectly, or altogether unknown, to the pupils; and a hospital of this extent might, I am inclined to believe, be conducted at less expense than is generally imagined. But although such a limited extent might be prudent, and even necessary at first, I trust that the students of this University will one day enjoy the benefits of a large hospital;—that the plan of the charity will be such as to admit of the greatest extension. For an important advantage is inseparable from a large hospital; not that of affording a large number of examples of the same affections, but of giving a probability of the occurrence of the more rare,—nay, indeed, of the rarest diseases, accidents, and operations, during the period every student frequents it. Besides the opportunity of becoming fully acquainted with all the ordinary cases of medicine and surgery, it is indispensable to a full and perfect education, that instances of every disease and accident which he may afterwards have to treat, should be witnessed by the student. Not only does the most elaborate description of a disease, or mechanical derangement, fall short of conveying an adequate idea, but the conception gradually fades away; or, if retained, is frequently not recalled when what was described chances to occur, after a lapse of time; and probably not till another person names the nature of the affection, do we see that it is what we formerly heard of; or if we suspect its nature, we still have our doubts. On the other hand, if diseases or accidents have once been seen,—*oculis subjecta fidelibus*,—when they again present themselves, they are immediately recognized. A striking exemplification of these remarks came under my observation when a student. A poor man, labouring under true scurvy, applied to a surgeon on account of the horrid state of his mouth;—his gums being swollen and spongy, and bleeding; his teeth loose, and his breath offensive. The surgeon, not having seen a case of scurvy, supposed the disease of the gums arose from a bad state of the teeth; and extracted several in succession. He was then sent to another, of high eminence and enormous practice, who pronounced it a case of fungus hæmatodes of the gums; and admitted him into his hospital, intending to resign him to his fate. Being visited, however, by a practitioner who had witnessed scurvy at a naval hospital, the nature of his disease was at once recognized:

some lemon-juice, and fresh meat, and vegetables, were prescribed; and he was well in a week or two. The surgeons, who were not aware of the nature of the complaint, were well-informed men; and the disease was one which all have heard of, and the leading symptoms of which are universally known. But though formerly very prevalent and fatal in London, it is now uncommon; and from the want of having witnessed it, these two gentlemen thus committed a serious error. It is of great importance to the student, that he should have witnessed also all the rarer accidents, and the rarer surgical operations. For all this a large hospital is indispensable; and I trust that we shall one day see a hospital connected with this institution, containing lying-in wards, for the purpose of an obstetrical clinique, and wards for the reception of mental diseases. If we but make a beginning, I feel confident that the public will support us. For to say nothing of the advantages of an hospital to the University, one is absolutely wanted in this situation. The eastern extremity of the metropolis, and the southern side, have the two great Borough hospitals, St. Bartholomew's, and the London. The western extremity has St. George's and the Westminster. But between the east and west, on the northern side, there is merely the small Middlesex Hospital; and in this immediate most populous neighbourhood, none at all; so that not only it, but the adjoining county, has not the advantages possessed by all the other districts within or around the metropolis. Were our University not in existence, the benevolent, on having these circumstances pointed out, would come forward; and if once a fund were established, legacies would be left as to other institutions, which have already more than they can advantageously spend; and when the benevolent see that by their support they would do *more* than further the ends of charity,—that they would, at the same time, aid in supplying their country with a succession of highly-informed practitioners, the double incentive, I am certain, would realize our most sanguine hopes.

While I rejoice in the establishment of an English school of Medicine, in a city, and on a plan, which will render it, if well conducted, equal to any, and far superior to most others, in the civilized world, I rejoice also that this school forms part of a University. Nothing is more to be desired, than that those who go forth into the world to practise the healing art, should be men of excellent education. In most countries of the Continent this is the case. The great body of practitioners there, receive a general education at a University, previously to commencing the study of their profession. They in truth receive what ought to be the education of a physician; and they *are* physicians. In this country those who carry on the great mass of practice,—those who, in addition to their original occupation of apothecary, have risen to the office, though not to the name, of physicians,—are indebted chiefly to their own exertions, for even their professional knowledge and skill. All the lectures, excepting perhaps those on Anatomy and Surgery, have been too scanty and

superficial; and the clinical instruction has been conducted too generally in a most careless manner; so that clinical lectures were actually unknown in London a few years ago, and an extremely small number of those whose chief business in life was to practise medicine ever thought of entering to the medical practice of an hospital, or of even a dispensary. No such systematic method of practical instruction, whether medical or surgical, as is proper,—no intrusting of the students more or less with the charge of patients, is even yet established; and no better education is given by parents to those children intended for medical practitioners, than to those whom they destine for trade; and at the same time when the best part of general education should begin, the youth, with all his capabilities of literary and philosophical attainment, is hurried off to mix draughts and weigh powders, the greater part of the day, for several years. The portion of time thus consumed, and the sum of money thus expended, would enable the youth of our profession to attain every acquirement of a high education. The young men who come to our schools, to prepare themselves for general practitioners are, in the majority of instances, as gentleman-like in their sentiments and manners, as intelligent, as anxious to learn everything that their instructors are disposed to teach them, as those who are sent to Oxford or Cambridge,—as young men of whatever station in society, and in the previous enjoyment of whatever advantages. I trust that ere long the five years' apprenticeship to learn the business of the dispenser, or (as that might be learned in as many months) I should rather say, the five years' apprenticeship to waste their time as shopmen, will be abolished; and instead of the present preposterous regulations, of five long years in the shop before a limb is dissected,—before a lecture on Anatomy, Chemistry, or any other subject is heard, and two years only in systematic public study,—in dissecting and attending so many lectures, and in gaining the experience afforded by the medical and surgical wards of hospital, and in reading (which previously would have been fruitless),—the youth will, through the medium of such establishments as the London University, acquire a good classical education, a knowledge of the three great continental languages,—the French, German, and the Italian,—and no inconsiderable acquaintance with Mathematics, Physics, and Mental Philosophy. By a change of plan, and by practicable facilities, I am confident that all this may be accomplished with no great increase of expense; and the young practitioner be ready for the commencement of his active career, at the age of two or three and twenty; and no one will deny, that a given expenditure of money and of time, ought to be made to produce the greatest possible advantages. These facilities will all be amply furnished by this University; and I hope that the Apothecaries' Company will one day be better pleased that those young gentlemen who go before them, should adduce testimonials of a respectable classical and mathematical education, a capability of reading the German, French, and Italian writers in the originals, and the possession of a share of Physics and Mental Philosophy; than if these

young gentlemen proved they had consumed five years, when the mind thirsts most ardently for knowledge, in drug-mixing, or such poor and desultory instruction as a private practitioner has time to bestow; and which must be as nothing before they begin to learn Anatomy, Physiology, and Chemistry, systematically and practically, at a public school.

An eminent scientific professor at Utrecht, in a pamphlet just published in English by Mr. Faraday, in answer to Mr. Babbage's complaint that science is on the decline among us, says;—"There are countries in Europe where no young man could think of studying Medicine, Mathematics, or Natural Science, with the help of Latin only; and without being prepared, before entering the University, with a sufficient knowledge of German, English, and French. The ignorance of foreign science in England, cannot be attributed to want of zeal, but to a defect in English education,—the ignorance of foreign languages, which it is perhaps the business of the London University to amend." I believe that all the philosophers of the Continent, hailed the foundation of the London University with delight; as an institution which would spread among the general youth of England a far more useful education, and far more liberal principles, than the two old Universities of England have considered it their business to furnish to their clerical and more aristocratical alumni; and as an institution in which every science would be fully taught.

If I am told that this improvement in education, will make the general practitioner equal in knowledge to the physician, I reply, that this will rejoice me beyond measure. I have no desire that the importance of physicians should be maintained, by the depression of the general practitioner. If the physician is to continue as superior to the general practitioner as he formerly was, he must advance in the same proportion; he must not presume to think of preventing the general practitioner from stepping towards him; he must also step forwards himself, to maintain his advantage. The physician, whose means have allowed him to spend more time than the general practitioner in his literary and scientific education, and in the subsequent study of his profession, and has spent it industriously; and who, when in practice, and exempt from the toils of Midwifery, and the other distractions which beset the general practitioner, and having not the whole of the art, but one branch only to cultivate, employs these advantages as his sense of duty must dictate,—will always acquire every reasonable advantage; and general practitioners will gladly avail themselves of his assistance, and will be proud of him as a supporter of the character of the profession. The mass of the middle classes of society, has begun a great movement in the acquisition of knowledge, in the discovery of rights, in the correction of absurdities, and in virtue and liberality of sentiment. The higher orders see the impossibility of arresting this progress; and titles and decorations will no longer command even notice, unless supported by real excellence. Among the higher ranks there are some, who,

so far from viewing this movement of other ranks with dread, step forward to promote it; and the share taken by some of exalted rank and office in the foundation of this University, demonstrates a liberality and generosity which will ever do honour to England, and are worthy of all imitation. So ought physicians to act towards the general practitioner;—to make every effort to improve his general education, and his professional knowledge. In fact, all those who lecture or practise at public institutions, act (whether they will or not) contrary to the narrow views of interest; for they are occupied in imparting knowledge to the rising generation of general practitioners;—occupied in endeavouring to make them as learned as themselves.

In *me* such narrow views would be the height of baseness, and would be the height of ingratitude; for I hesitate not to avow—I rejoice in this public opportunity of declaring it—that to the general practitioners of England, Scotland, and Ireland, I am indebted for success in my profession. When I commenced my professional career, I determined upon seeking for success by working hard; and by conducting myself as well as the infirmity of human nature would allow. I determined, however long I might wait for success, never to fawn upon and run after my superiors, nor to stoop meanly to my inferiors; never to intrigue for an advantage, nor to employ trumpery artifices for making myself known to the public. For many years I toiled; and saw most of my contemporaries, nay, of my juniors (who worked less, but were wiser in their generation) pass by me. I published work after work — edition after edition; and paper after paper was honoured with a place in the Transactions of the first Medical Society in Europe. I was physician to a large metropolitan hospital; and had attended there, and gratuitously out of doors, above twenty thousand patients. But in vain. In 1828 my profession was no more lucrative to me, was as short of my actual expenses, as it had been in 1818. At that time the *Lancet* was pleased now and then to publish a clinical lecture, delivered by me at St. Thomas's; and my practice at once doubled. The following year it published the greater part as I delivered them; and my practice doubled again. Last season the *Lancet* published them all; the *Medical Gazette* followed its example; and my practice has now doubled a third time. This astonished me; the more as my clinical lectures were generally delivered with little or no premeditation; while all that I published myself had cost me great labour, many a headache, and much midnight oil. It was through the general practitioners, in the large majority of instances, and through general practitioners, for the most part, with whom I had not the honour of any acquaintance, that the publication of those lectures accomplished my success. To the body of general practitioners, therefore, I owe a debt of gratitude. They have called me forth spontaneously from no interested motive; and I cannot exert myself too much in the education of their successors.

Conscious though I am that my lectures will not be without

defects, I still can promise diligence, and the omission of no anxious care. The pupils will never find me maintaining a professorial distance; but always bearing myself as their friend, and only as a student of longer standing than themselves. I thus have always conducted myself towards the students of St. Thomas's, and never met with rudeness, or even with neglect; but, on the contrary, have ever experienced the most affectionate respect. In the ancient statutes of Oxford it was enjoined, that "after lecture the professors should tarry for some time in the schools; and, if any scholar or auditor may wish to argue against what may have been delivered from the chair, or may otherwise have any dubiety to resolve, they should listen to him kindly, and satisfy his difficulties and doubts." In the spirit of this good rule I shall always act; and, in season and out of season, not only *during* lecture but *after* lecture, and in my own house whenever it may be desired, the student will ever find me ready to impart any information, and to give him any counsel in my power.

GENERAL OBSERVATIONS.

It appears to be a law of the universe, that every thing shall undergo incessant change. Whether the universe be eternal or not; whether we believe it has existed (according to the opinions of some ancient philosophers) from eternity, and is to exist to eternity; or whether we are so to understand Scripture, as that not only the arrangement of all things, but all things themselves, had a beginning, and must have an end; yet while the universe is in existence, it appears to be the law of the Creator that every thing in it shall undergo incessant change.

Both the material and the animate world are in this predicament. The most minute aggregate of matter, and the largest material bodies, appear only destined for certain periods of continuation in their existing state. We see with respect to our own earth, that countries are continually lessened and destroyed by the encroachments of the sea and by eruptions; and on the other hand, from similar circumstances, other countries are produced; so that it is probable that the appearance of the earth at present, is totally different from what it once was, and that after a period it will be totally different from what it now is. Even with respect to other worlds, there is every reason for astronomers to believe, that many have been destroyed; and that some worlds which are now seen, are but fragments of others which have been broken to pieces.

With respect to the animated part of the creation, every vegetable,—every animal, has but a limited period destined for its existence. This period is exceedingly various; for some animals are destined to live but a few hours, while others again appear to live for centuries.

But besides this definite period, every animated being is liable to be cut off long before its natural period has arrived. Animals and vegetables are all exposed to violence of every description;—not

only to *mechanical* violence, but to the destructive operation of ten thousand causes; and to disturbance from the cessation of the circumstances which are necessary to their existence. One animal is destined to devour another while in its prime; nay, to destroy the element of what would be the young—to destroy the eggs, for example, of another; and myriads of insects are continually destroyed in storms. Constantly, therefore, the limit which Providence appears to have placed to every thing is curtailed—every animal and vegetable is subject to be cut short long before that limit is reached; so that there appears to be a perpetual struggling throughout nature; —the Creator having, on the one hand, invested every animated being (whether vegetable or animal) with a power to exist for a certain time, and to resist injurious agencies; and having provided, on the other hand, injurious agencies without number, to injure and to cut it off before its time.

It has been said by some philosophers, that to look at man one would suppose that he was destined to live to all eternity;—that, at first sight, such a machine as the human body, unless destroyed by external violence, would appear capable of lasting for ever; and that it is by experience alone we are taught the contrary. *Primo statim aspectu talis machina, nisi fortè vi externâ corrup'a, in omne ævum durabilis videtur; et quidem solâ experientiâ contrarium docemur.*

However, there is nothing in the appearance of the human machine which would lead us to suppose that it could last for ever. Whatever we know of nature can only be learned from experience; and it would be as correct to say that because it is summer we should believe it will be summer for ever, or because it is day we should believe it will be day for ever, unless we have contrary experience, as it would be to say, that the human machine in itself appears capable of lasting for ever. We can learn nothing from taking a partial view of things; for it is impossible to form a judgment of nature, except by taking a continuous and enlarged view. It would also be contrary to all analogy, to suppose that the human machine is capable of lasting to eternity.

With respect to the injurious circumstances which are positive, and to which animals are exposed, and by which they may be cut off before their full period has arrived, they are those, in the first place, of mechanical violence; and likewise those of a specific nature. Many animals and many vegetables contain within them materials, which are destructive to the life of others.

They are liable to be destroyed, also, from a want of suitable external circumstances; for a series of actions is incessantly going on in every animated machine, and those actions are maintained by external circumstances;—such as by a certain degree of temperature, by a certain surrounding atmosphere, and by a certain supply of matter to be taken into the mouth or stomach, or something equivalent. The deprivation of any of these may put a stop to existence, or may impair it; and the excess, on the other hand, of some of these, will have the same effect. The excess of food may destroy or

injure life; and the excess of heat may cause serious injury, or absolutely consume the body. Besides this, the depraved quality of those external matters which are necessary to the continuance of life, will have an injurious effect. The unwholesomeness of bad food is a circumstance particularly illustrative of this.

One of the most common causes—indeed, I may say, the most common cause of diseases, is a deviation with respect to external temperature. A certain degree of heat is required for the support of life; and a deviation in that particular is the most common cause of the diseases that we see here. An excessive degree of heat produces one set of effects; an excessive degree of cold produces another; and an alternation of the two, from the body being suddenly exposed first to the one and then to the other (more especially if this exposure be partial) is attended by the most serious effects. The greater number of diseases are inflammatory; and the most common cause of inflammation is sudden alternations, or other unfavourable circumstances, in regard to temperature.

Bad air is also a common cause of disease; but this does not arise from the want of oxygen in particular, as has been imagined; but from the presence of certain substances of deleterious quality. I believe it is found that the quantity of oxygen in the air, is the same in almost every country and in every situation; and it is the presence of other things, in addition to the oxygen, which produces the injurious effect. We see the effect of the bad quality of the air in unhealthy situations, where persons are sallow and bloated, and carry about with them marks of disease visible enough to others who come from a healthy spot, although these are not allowed by the parties themselves to exist; simply for this reason,—that they are so accustomed to what they witness, that they conceive it to be their nature.

The ill effects of unwholesome food are seen every day. The body is rendered feeble; and when this takes place, whether from bad air or bad food, it becomes an easy prey to any other cause of disease which may present itself. Want of the rest necessary for the refreshment of the body, has also the effect of producing disease. Excessive action, too, either of the mind or any part of the body, has likewise the same tendency.

Thus disease is continually produced from mechanical violence, from the presence of injurious agents, and from errors in regard to those agents which are absolutely necessary to the support of life,—whether it be the error of excess, deprivation of their proper quantity, or depreciation of their quality.

This, however, is not all. When a disease has been induced, it frequently happens that a tendency to that disease is transmitted to the offspring of the sufferer; so that it requires no exposure of such offspring to the particular cause of the disease, in order to become its victim; but at a certain period of life, unless placed in very happy circumstances—and perhaps in spite of the happiest circumstances possible—the disease under which the parent laboured appears in

the child, or in a still later offspring, and possibly cannot be controlled. Again, independently of the external circumstances to which the offspring is exposed, and inherent disposition to disease, original malformation of certain parts of the body so disorders its functions, that sooner or later disease appears, which may end in death.

Now when disease takes place, the functions of the body go wrong. A series of actions is continually taking place in the body; and some of these, when what is called *disease* occurs, become deranged. The circulation of the blood is altered; more is accumulated in some parts than there should be, and less in others. The temperature of the body is altered; it is too hot either partially or generally, or it is too cold. The feelings of the body are altered; they become too acute or too dull, or they become otherwise wrong. The strength of the body likewise is changed; in some few instances it is increased, but in the great majority it is impaired. What is done naturally in the body before this change takes place, is now done either too little, or too much, or in a depraved manner. The products of the body are likewise altered. The sweat is not natural in its quality, any more than in its quantity; the urine becomes altered in its quality; and the secretions poured forth from the intestines likewise in theirs; and I have no doubt that the excretion from the bronchial tubes, is likewise changed in its constituent proportion. At last, even the structure of the body will become affected. Not merely are the *actions* of the body altered, and the *products* excreted from it; but the very *substance* of the body itself will become changed.

With respect, however, to all the changes I have just enumerated, they must evidently be in a certain intensity;—a certain degree of them must exist, for us to say that disease is present. A change, although, strictly speaking, you might say it was a disease, may be so inconsiderable, that one would be laughed at for calling it by that name. A slight spot upon the surface,—a single point not larger than a flea-bite, no one would think of calling a disease: and yet, if there were a large number of these, though the only difference consisted in amount (the nature and degree of each being exactly the same,) we should not hesitate to say that disease was present. Therefore, when a deviation with respect to function or structure takes place, there must be a certain extent of it, or a certain intensity of it (one or the other) to justify us in saying it is really a disease. Logically and strictly speaking, disease is said to be "an aberration of function or structure of one or more organs from a sound state." You will find this mentioned in some books, as the definition of a disease. But this is hardly sufficient; because, with respect to *structure* a part may be sound, and even with respect to *function*, and yet be in a state of disease. A part may grow to a much greater size than natural,—there may be diseased bulk of the organ, although the structure is healthy. This is a rare occurrence; but sometimes it does take place. Generally, where there is increased bulk there is diseased structure; but it is possible for a part to be enormously

large, without being altered in structure; and yet the person may be said to be labouring under disease. A person with an enormous liver, or brain, though no unhealthy change could be discovered in its texture, would nevertheless be pronounced to be in a state of disease.

So with respect to the fluids; they also suffer very great changes, and yet there may be no fault of function. In the disease called *anæmia*, where the blood is deficient in quantity, the disease may really be quite independent of any fault of the body itself. A mere want of nourishment may cause the blood to be of a diseased quality; —that is to say, not to contain its natural elements, but to be very watery,—to be thin and pale; the whole body becoming white or tallowy in appearance; and yet no function can be said to be diseased, at least excepting through this. The body is ready to do all that is required of it, if proper food be given. Therefore this definition of disease, you find, is more or less exceptionable. Besides, in a large number of diseases, the quality of the fluids is altered: and it is essential to a correct definition, that this should be taken into account.

With respect to the *extent* of affection which is necessary to exist in order to constitute a disease, there must be a great difference in various individuals; for the health of different persons is exceedingly various. What is health to one man, would be disease in another; just as the degree of strength which is natural to a delicate person, would be considered downright weakness in another. To obviate any difficulty of this kind, you will sometimes find added to the definition of disease which I have already given,—"rendering assistance necessary." The definition given in Dr. Gregory's Conspectus is: —A disease is present, when the customary actions of the body are either altogether impeded, or performed with difficulty and pain. "*Morbus adest, quum corpus tantum a statu sano deflexerit, ut solitæ actiones vel prorsus impediantur, vel ægre aut cum dolore perficiantur.*"

Disease, therefore, may generally perhaps be defined to be,—"an aberration of function, or structure, or size, of one or more organs; or of the quality of the fluids, from the sound state;—rendering assistance necessary."

This, however, you will observe, is only a definition of disease in general; and I shall have to make some remarks upon the definition of each particular disease hereafter. You will thus see, that diseases are neither more nor less than alterations in the physiology or anatomy of the body;—that they are Morbid Physiology, and Morbid Anatomy. This morbid state of physiology, and this morbid state of anatomy, are together called *Pathology*. The doctrine of diseases, whether as it regards function or composition, is called *pathology*. There is an inclination, in the present day, to limit the word "*pathology*" to Morbid Anatomy. That, however, I think, is quite unjustifiable; for Pathology is the doctrine of disease, whether it relates to function, or structure, or both. Pathology, therefore, is an unhealthy state (if I may so speak) of Physiology and of Ana-

tomy;—the composition of the fluids, as well as function, being comprehended under the term "*physiology;*"—size, as well as structure, being comprehended under the term "*anatomy.*"

Now diseases are often divided into those which are *functional*, and those which are *structural;* but it is very common for the one to terminate in the other;—for diseases which are at first purely functional, to become at last structural; or, at any rate, many organic diseases do not at first exhibit themselves as such, but are ushered in by a change of function. It is possible that a minute change of structure may exist, long before it is discovered; and that minute change is enough to explain the alteration of function; but many diseases exist long, to all appearance, as mere functional disturbance, before they become structural. Many diseases remain functional,—at least they go through their course as a disturbance of function, never affecting the structure; but structural diseases almost always disturb function. It is evident that if the structure of an organ which is to perform a certain duty be much altered, that duty cannot be well discharged.

Structural diseases are sometimes called *organic.* I believe that the words "*structural*" and "*organic*" are used synonymously, to express those diseases which consist in a change of composition and arrangement of the organ itself, and not a mere alteration in the mode in which it does its duty. Perhaps the word "*organic*" is preferable to the word "*structural;*" and for this reason,—that some diseases of this description do not appear to consist in any alteration of structure, but merely in a diminution or an excess of bulk. Now in those cases which, though they are rare, nevertheless do sometimes occur, in which an organ wastes, or becomes larger than natural, and yet appears otherwise healthy, the affection cannot exactly be called "*structural;*"—the word "*organic*" better applies to them; and therefore, altogether, the term "*organic*" may be preferred to "*structural.*"

There has been an attempt by some to call the one set of complaints, supposed to be merely functional,—*disorders;* and the others, which are structural or organic,—*diseases.* For instance, to call dyspepsia, or diabetes, a "disorder;" and ulceration or cancer of the stomach, or ulceration of the kidneys, a "disease." You will not, however, find this generally adopted. It might be very well if all persons agreed to adopt the terms in this sense. But that is not the case: indeed, so far from it, that, in most books, the expression "organic or structural *disease*" occurs; which would not be necessary if every one adopted the word "*disease,*" to signify in itself a structural affection. Nay, so extensively is the word "*disease*" employed by some persons, that even accidents, as dislocations or fractures, are called disease. You will find, in Cullen's Nosology, that dislocation and fracture are arranged under the class of local *diseases.* The word disease, then, is used by some nosologists very extensively; they employ it to signify accidents, mechanical affections, dislocations, hernia, and every thing of that description; and it is used by

almost all writers to signify both functional and structural affections. I shall not, therefore, attempt to use the word "*disease*" to signify organic affections exclusively; but all depraved conditions, whether functional or organic.

Disease may be considered accordingly as it is *local* or *general*. Some diseases affect only one part, and others are supposed to affect the whole system. Fever, for example, is supposed by many to be a general affection, and it has been instanced as such; others, however, now deny that there is any such thing as a general disease, and assert that fever is only an inflammation of one part or other of the body. You will find that Broussais maintains the latter doctrine. However, I can entertain no doubt that there are such things as general diseases; and it appears to me that scurvy is of this description, for every fluid of the body seems vitiated;—at least the blood throughout the whole body is so, and all the solids appear to be in a similar state. There is no one part of the body that can be fixed upon as the seat of the malady; and therefore I think scurvy a fair illustration of general disease. So with respect to ague. I cannot discover any reason for ascribing the disease to any one part of the frame; and I therefore think that it also is an instance of a general affection.

Diseases are also different from each other accordingly as they are *acute* or *chronic*. Some diseases come on suddenly, last usually but for a short time, terminate either in health or death,—*cita mors venit aut victoria læta*,—and are called *acute*. Other diseases last for a long time, perhaps coming on slowly; but whether they come on slowly or suddenly, if they last for a long time, they are called *chronic*. Acute diseases, however, will sometimes, instead of terminating in health or death, become chronic;—that is, become less violent in their degree, and go on for a length of time. Diseases, therefore, are to be considered acute or chronic according to their duration.

You will find that diseases are also considered, by some, accordingly as they are *active* or *passive*;—that is to say, accordingly as they are attended with a degree of violence or excitement of the system, or no excitement at all. You will find some persons (indeed a large number) use the terms "*active*" and "*passive*," and "*acute*" and "*chronic*," synonymously; but this is an error against which I am particularly anxious to guard you. It does not follow because a disease is acute—that is to say, exists for a short time, and then terminates—that it is necessarily attended by violent symptoms; nor does it follow, because it lasts for a length of time, that these symptoms should not be active. This is every day illustrated in the case of rheumatism. It is daily spoken of as acute or chronic, and active or passive; the term acute being used indifferently with active, and chronic with passive; so that, in the chronic form of the affection, a person would not think at first of applying such remedies as in an acute attack; taking it for granted that, as the disease is chronic, there is no violence; but that a slowness of mischief is going on, and that the

remedies for the active acute state are improper. But you see cases of rheumatism every day, which have lasted for six or twelve months, or even longer, attended with all the symptoms of an acute disease;—that is, attended, if not by quickness of pulse, by heat of the parts; and if you take away blood, you find it buffed. It would, therefore, be a serious error, if you were to consider "*active*" and "*passive*," as synonymous terms with "*acute*" and "*chronic;*" because in acute diseases, the word "*acute*" refers simply to their short duration; and in chronic diseases, the word "*chronic*" simply to their long duration; whereas the word "*active*" refers to the violent disturbance going on, in the system or part, and the word "*passive*" to slow changes,—changes not of a violent description. A *chronic* disease may be *active;* and an *acute* affection may be *passive.* A person with an acute affection may lose all his powers, and the whole functions of the body may go on in the most languid way; and therefore acute and chronic are one kind of thing, active and passive are another. An *acute* affection cannot be *chronic*, but it may be *passive;* and a *chronic* affection cannot be *acute*, but it may be *active.*

You will find diseases differ also according to their uniformity of duration. Some diseases continue with uniform tenour during their whole course,—without any very great deviation from the beginning till the end; and these are called *continued.* Other diseases, again, undergo a very great remission at regular periods, or at least pretty regular periods; and then they are called *remittent;*—the symptoms not going off entirely till the disease ceases altogether, but undergoing such a relaxation of severity at such periods, as to acquire a character from this circumstance. Other diseases, again, will cease entirely from time to time, and generally too at stated times, and recur again at certain intervals, as long as the person is affected with them; these are called *intermittent.* This is particularly seen in the case of fever. Fever may hold a pretty uniform course,—never ceasing at all, or particularly diminishing, during the twenty-four hours till its close; and we then call it "continued" fever. It may last for a day, a week, or several weeks. Others are characterized by a sudden diminution in the degree of heat, violence of pulse, thirst, and all the other symptoms, at a certain period in the twenty-four hours, and perhaps at longer intervals, but not ceasing entirely: such is the character of "remittent" fever. Others, again, cease entirely. The patient will be attacked at a certain hour; be ill a certain number of hours; and then be perfectly well, with the exception perhaps of languor; the fever then receives the name of "intermittent."

Diseases differ, therefore, accordingly as they affect function or structure; accordingly as they are local or general; accordingly as they are acute or chronic; accordingly as they are active or passive; and accordingly as they are continued, remittent, or intermittent.

Diseases likewise differ exceedingly in their true inherent *nature*, independently of any other circumstances. They differ also as to

their *causes*. Some are produced merely by an aberration as to some of the circumstances which are necessary to the support of life, such as the excess of temperature or food; or a deprivation of food or air; or a *diminution* of food or air. Others, again, are produced by specific causes,—by the agency of particular substances, the nature of which cannot be comprehended; such, for example, is ague, which is produced only by a certain exhalation; and such is small-pox; and such are all those diseases which acknowledge a peculiar specific poison for their cause. Diseases differ, likewise, according to the *organ* which they affect. There are some diseases which can affect almost every organ in the body. Inflammation is one which affects every part of the frame which has vessels; but there are certain diseases that can only affect particular organs. Diabetes, for example, can affect, so far as we can judge of it, only the kidney; and the tendency to produce gall-stones, can evidently affect no other part than the biliary system. Therefore diseases differ, in addition to all the circumstances previously mentioned, accordingly as they may affect any part of the body at large, or are necessarily confined in their operation to particular organs.

With respect to the *causes* of disease, you will find them generally divided by authors into two,—the *remote* and the *proximate*. The remote causes, again, are divided by systematic writers into two more, *predisposing* and *exciting*. The word "*cause*," however, is in these cases used in a totally different sense. When we speak of "*remote* causes," a very different idea presents itself to you than when we speak of "*proximate* causes;"—in fact, the cause of the disease, properly speaking, can only be remote. For example, the remote cause of fever may be bad food, and the depressing passions; and the exciting cause may be, according to some, a specific contagion. Now the remote causes of the first description are called *predisposing;* they render the body liable to become the prey of something, which has a tendency to excite the disease. The exciting cause of the disease might have had no effect, unless the body had been predisposed; and the predisposition might not have had the effect, unless the exciting cause had occurred. A circumstance, therefore, which inclines the body to become the subject of disease, is called a predisposing cause—*causa prædisponens;* that which actually excites the disease, exciting—*causa excitans;* and both together are called *causæ remotæ*. They are called remote, I presume, because they are a little distance from the disease itself; and because the proximate cause is, to all intents and purposes, close to and all but the actual disease; and, in one sense at least, it is the disease itself.

The application of this term gives rise to a great deal of confusion to the student. You would imagine that disease could be nothing more than disease; and to call the disease the proximate cause, would be thought absurd; but the reason of this I will explain. In defining any particular disease, we are obliged to take into our definition only what we observe; just as the naturalist defines any

flower, or any mineralogical specimen, by merely taking what is the object of sense, and describing it with all the marks together; and thus we have what is called the definition of a disease. For example, in jaundice you take the yellowness of the skin, the yellowness of the eyes, the yellowness of the nails, the whiteness of the fæces, and the high colour of the urine, together; and you say that the patient certainly has jaundice. The jaundice is not the disease, strictly speaking; but the collection of symptoms under which the patient labours, is called jaundice. The word "*disease*" is thus applied by nosologists, not to the single *cause* of all these symptoms, but to the *collection* of symptoms. Take epilepsy: a person falls down foaming at the mouth; struggling in every limb; perfectly unconscious; and afterwards, when he ceases to foam and struggle, he lies senseless; such a person is said to labour under epilepsy. These particular symptoms, blended together, occurring in succession, are called epilepsy. Now in Cullen's, and other methodical nosologies, you will find the disease defined according to mere symptoms;—all opinion, all cause, is excluded. You take merely the symptoms, and you call them the disease; and it is perfectly right that it should be so. But these symptoms must have a cause; there must be a cause for this disturbance in epilepsy;—there must be a cause for the bile going into the blood in jaundice, appearing in the urine, and not being able to find its way to the fæces. The cause of the epilepsy, or of the jaundice, is the circumstance that produces all these effects; and that is considered to be the "proximate" cause. If the epilepsy arose from a piece of bone depressed upon the brain, you would say the proximate cause of the epilepsy was the spiculum of bone. If the bile were obstructed because a calculus was impacted in the hepatic duct, you would say the impaction of the calculus was the proximate cause of the jaundice. You therefore observe that the proximate cause is, in fact, the disease itself;—the actual disease from which the symptoms arise. The *remote* causes are those that predispose to the disease, or actually excite it; the *proximate* cause is the circumstance to which the *predisposing* and *exciting* causes have given rise; and this circumstance, when present, produces all the external symptoms,—the visible changes.

But the word "*disease,*" when you come to any specific affection, is (in a nosological sense) applied merely to a set of symptoms;—to that which we can comprehend,—which is discernible; and as nosologists, we should not apply the word "*disease*" to the cause of all these symptoms; but should call it the *proximate cause.* You will find, however, when speaking as *pathologists*, and not as *nosologists*, that persons inquire, what is the actual disease in this epilepsy? What is the actual disease in this jaundice? Is it an enlarged pancreas pressing upon the ducts? Is it a calculus sticking there? Is the disease a contraction of the sides of the ducts, or what is it? But that is a different sense of the word "*disease;*" and it is necessary that you should know that the term is employed by methodical nosologists, and must be so by me, to signify a collection

of symptoms; and not the true *cause*, which is at the bottom of those symptoms; for though we might be inclined to say that this was the real disease, yet it is not so considered, but has received the appellation—"*proximate cause.*"

I trust, therefore, from the explanation now given, you will hereafter escape any confusion which might otherwise arise; because, for want of understanding this, you will hear persons quibble about what is a disease, and what is not. It is necessary to know that a set of symptoms, following in a certain order, or united in a certain collection, is called a disease; and the *immediate* cause of all these symptoms—which some say is the real disease—is called by the best writers the proximate cause.

I must now enter a little more minutely into the explanation of certain expressions, which will be used throughout the course; because, unless they are understood, it will be impossible for me to speak intelligibly. The whole doctrine of disease together is called *General Pathology*. Pathology is the science of disease—the *ægroti hominis scientia;* while Physiology is the science of man in health. I of course mean *human* physiology. General Pathology is commonly said to embrace four particulars:—First, general *nosology;* that is to say, an account of diseases in general, and of their chief differences. Secondly, an account of the *symptoms* of disease, which is called *semeiology*, or *symptomatology*. Thirdly, the *causes* of disease, which is called *ætiology*. And fourthly, the *treatment* of disease, which is called *therapeia*.

With respect, however, to pathology, there is not only a *general* but a *special* pathology, which respects particular diseases; and if the epithet "*methodical*" is attached to *nosology*, an arrangement of diseases is meant;—a classification of the various affections to which we are liable. I shall first speak of what is called *general* nosology, or the consideration of diseases in general. These may be *local* or *general:* when they are local, however, they seldom continue so without producing more or less general effects. Diseases vary in their symptoms, and in their course, according to the texture which they affect. You know that the body consists of a certain number of textures; that the various parts of the frame may be resolved into a certain number of particular tissues, as they are called. Now some diseases affect certain textures; and others affect other textures; and the symptoms of diseases, and their course, are influenced very much by the texture which is thus affected. To take inflammation, for example, we shall find that the symptoms are very different when it affects a *serous* membrane, from what they are when it affects a *mucous* membrane. Again, the symptoms are very different when it affects the skin, or when it affects a bone. The symptoms of disease, too, and the course of diseases, vary exceedingly, according to the organ. Diseases may not only attack a particular organ, but they may attack a particular texture in a particular organ, or they may attack all the textures of an organ. Now when they do attack any particular organ, the importance of

that organ to the economy, the function which it performs in health, the whole set of relations of that organ, greatly influence the symptoms. For example, inflammation which may be of no consequence in the finger, may (though only to the same extent) be fatal when seated in the stomach; a little ulceration, of not the slightest importance on the hand, may produce death if it occur in the stomach; an affection in the brain, or in the heart, may be productive of very different results—a very different degree of danger, from what it would if seated in many other parts.

Diseases likewise vary exceedingly, accordingly as they are attended by *excessive* or by *diminished* action. Some diseases are characterised by an inordinate, violent action of the part;—the natural state of the part seems augmented. Whatever is done in health, is done ten times more in the disease,—at least for a time, till the strength is exhausted, or the state gradually subsides into health. Other diseases are characterised from the beginning, or nearly so, by a great diminution of action. The natural functions of the part decline exceedingly; so that depression is the character of the disease. If the part affected be one characterised by feeling (such as the surface of the body) the feeling may become very intense. If it be one whose function is motion, the latter may become very intense, and you may have convulsions as the consequence. On the other hand, you may have a *diminution* of feeling,—perfect torpor,—insensibility; and such an absence of all power of motion, that the part is useless to the individual. Again, if the part be one which secretes, the secretion may be in *excess;* and if it cannot escape we have dropsy. The secretion, on the other hand, may be exceedingly *diminished;* so that, in the case of the kidneys, no urine can be formed; and in the case of the skin, the surface shall be perfectly dry.

Some diseases, among structural affections, are attended by a great dilatation of the part; the part becoming much dilated, beyond its natural extent. On the other hand, in some diseases, the parts become contracted and diminished. In some diseases the parts become exceedingly hardened; so that from being naturally soft, they become as firm as cartilage; and are sometimes converted into absolute bone. Again, very firm parts will occasionally become perfectly soft; and bone will become as pliable as muscle. I myself have seen the liver become softened down to a pulp, to all appearance, in the course of three days.

Again, diseased parts will become exceedingly full,—distended with fluid; and this may be *general* or *local*. It may be local congestion, or universal plethora of the body. In other instances, the parts become devoid of fluid, and shrink; and this is observed also generally or locally. Alterations of texture likewise take place, and alterations in the quality of the fluids. The texture,—to say nothing of induration, softening, hypertrophy, or atrophy,—the texture of the parts sometimes becomes perfectly different from what it is observed to be in the state of health. So with respect to the fluids,

they will frequently be formed of a character totally dissimilar from what they should be. The urine is sometimes any thing but genuine urine; and the bile is sometimes so pale that you can scarcely recognise it as bile; and so with respect to the blood itself; it is sometimes very little more than a reddish watery fluid.

These are important and essential differences in disease. There are, however, many other varieties, which are considered more or less accidental;—that is to say, which do not affect the nature and course of the disease. For example, some diseases are hereditary, and this will not at all influence the nature of their course or duration; but some diseases may be hereditary in the particular individual; while other diseases are not hereditary,—not transmitted from parent or ancestor to offspring or posterity, but still are born in the individual. They seem to be implanted in him at his first formation; and then they are called only *connate* or *congenital*. A disease which is connate, or congenital, may be hereditary; but it is not necessarily so. All diseases which are neither hereditary, nor connate or congenital, are said to be *acquired*.

Then diseases—to speak still of accidental varieties—are sometimes *primary*, and somtimes *secondary*. Sometimes the disease which occurs is the first; but sometimes, after one disease has taken place, it is joined by another;—that is to say, it exists with another, or gives such a predisposition that another is produced; but it is of no consequence to the nature of a disease, whether it is primary or secondary.

Again, diseases are sometimes said to be *sporadic*, sometimes *endemic*, sometimes *epidemic*. A disease is said to be *sporadic*, when it occurs from an accidental circumstance occurring to any particular individual;—when it is a solitary accidental case. Hence, when a person, by exposure to cold, suffers inflammation of the lungs or intestines, he is said to labour under a sporadic disease. These are insulated cases, having no connexion with each other, not having any general prevailing cause. But if diseases occur from some general and temporary cause affecting a whole population, then they are said to be *epidemic*. Sporadic and epidemic, therefore, stand contrasted with each other; diseases of the former class being those which occur occasionally and accidentally, from some peculiar circumstance happening to the individual; while epidemic diseases are those which affect a large mass of persons, from some general prevailing cause. Again, diseases are sometimes said to be *endemic*;—that is to say, when they do not arise from any general influence at a particular time, pervading a population, but when they spring from certain causes fixed and inherent to a certain place;—when certain places in which people reside, send forth causes of disease, which all persons who come to that spot are liable to, but from which persons do not suffer unless they go there. This is the distinction between endemic and epidemic diseases;—the former being confined to the inhabitants of a particular spot; and the latter being those which arise from a general cause, taking place only from time to

time, and pervading, not a particular spot, but a considerable population.

Another difference in diseases, not at all affecting their nature, their course, or their treatment, is, that they may arise from a common cause, or from a specific contagion. Some diseases are contagious and some are not, but the symptoms do not vary in their essential nature; so that we are continually very much in doubt, as to whether a certain disease is contagious or not. There is nothing in the disease itself, to make us say that it must necessarily be contagious; and the greatest disputes are carried on, as to whether a particular affection is or is not contagious.

Diseases have likewise been distinguished according to the time of year at which they occur; so that we have vernal, summer, autumnal, and winter affections;—*vernales*, *æstivi*, *autumnales*, *hyemales*. Other accidental differences of disease arise from their seat, —whether they are internal or external;—and then, again, as to whether they are fixed, or whether they wander. If they cease in one particular part, and appear in another, they are said to be *metastatic*, or *retrograde*, or *retrocedent*. If disease suddenly cease in one part, and another become affected, a metastasis, or change of place, is said to have occurred.

Diseases differ according to their severity. Some are exceedingly severe, others are light;—some are said to be mild, and others are said to be malignant. Those which are said to be of a malignant character, however mild they may be in appearance, are sure to baffle all the resources of our art, unless we can eradicate the affected part by a surgical operation; which sometimes is, but sometimes is not, possible. However, the word "*malignant*" is sometimes employed simply to denote a certain degree of severity; it is a term of rather indefinite meaning. Small-pox is said sometimes to be mild, and sometimes malignant;—and, again, a sore which is of a cancerous nature, however trifling the pain it may be attended with at first, but which is sure to go on to ulceration, violent pain, and, at last, destruction of the part, is also said to be malignant.

Diseases vary likewise as to their duration. If they be exceedingly short, so as to terminate within four days, they are called by Latin authors *acutissimi;* but if they terminate within seven days, then they are called *peracuti*. We have no English words to signify the difference between these two durations. If they terminate within fourteen days, they are called *acute;* if they run on to twenty days, then you will find authors calling them *sub-acute;* and some are so nice in their terms, that if they last forty days they call them *acuti decidui;* and all that run on above that period are called *chronic*. It is sufficient, perhaps, to remember, that an acute disease is considered one which terminates within fourteen days;—a sub-acute one which terminates within twenty; for though some authors make a still more nice distinction, and call a disease subacute which terminates within twenty days, and apply the term *decidui acuti* to those which extend to forty; yet if the disease extend

to or above twenty days, we may consider it chronic;—at least I fancy a *patient* would think we were justified in so denominating it.

Diseases, again, are considered as to whether they are continued, or intermittent, or remittent. *Continued* diseases are generally understood to embrace two varieties as to course: namely, diseases which pursue one uniform course to the end, and are called *continuent;* and those which relax from time to time, and are called *remittent.* You find many persons speak of continued disease, as distinct from remittent; and it is so common that we are justified in using the distinction; but some make a nicer distinction, and use the word "*continued*" to include *continuent* (that is to say, one which preserves the same tenor to the end,) and *remittent* (one which, although it never ceases, yet relaxes from time to time.) Diseases, however, are sometimes *intermittent;*—they absolutely cease altogether at intervals, and then recur again. If intermittent diseases recur and disappear at regular intervals, then they are called *periodical.* A periodical disease is necessarily intermittent; but an intermittent disease is not necessarily periodical. Intermittent embraces the circumstances of simple intermission, no matter when or how; but it embraces also regular intermission,—periodical disease. The presence of a disease which is intermittent, is called the *paroxysm,* or *exacerbation,*—these being considered synonymous terms; and the interval which occurs between them, is called the *intermission;* or, in case of febrile disease, the period of *apyrexia,*—the period of the absence of pyrexia.

I fear being troublesome in mentioning the meaning of so many terms; but it is absolutely necessary that they should be understood before we proceed to speak of particular diseases. I will now make a few more minute observations, in regard to what I said of the *causes* of disease.

The remote causes, I mentioned, have been divided into two;—the *predisposing* and *exciting;* those which are exciting, you will find are by some authors called *occasional* or *procatartic.* Generally, in England, we say "predisposing," or "exciting;" but in foreign books you will find a variety of other names employed.

In regard to the *predisposing* causes of disease, they depend upon a very great number of circumstances. Each particular age, for example, is predisposed to particular affections. The child is predisposed to one kind of disease, the youth to another, the adult to another, and the old man to a very different set. Climate, also, causes a great difference in the disposition to disease; the season of the year, likewise, has a great effect; the habit of the individual, as to temperance and sobriety, and as to a natural or unnatural and artificial course of life, has a peculiar influence. All these circumstances cause a predisposition to different affections. In regard to some diseases, there is not so much a *predisposition* required, as a *want* of *indisposition.* For example, almost every one will take the small-pox, the measles, and the hooping-cough; so that we can hardly say that there is a predisposition to these diseases; the cases

in which they do not occur are rare exceptions; and we are more justified in saying, when these diseases will not occur in spite of the presence of contagion, that the person is *indisposed* to them, than that those who catch them are *predisposed* to them;—that is to say, by nature we are *all* more or less liable to them; and it would be almost an abuse of terms to say that we were predisposed to them. All that appears to be requisite is, that there should be no indisposition to them.

With respect to the *exciting* causes of disease, they have been generally classed in three orders;—those which excite or stimulate, those which depress or debilitate, and those which exert a physical or physico-chemical action. Heat, and excess in wine, are *stimulating* causes of disease; the depressing passions, and an excessive loss of blood, may be instanced as *debilitating* causes of disease; and these debilitating causes you will find, when you read some Italian authors, spoken of as *contra-stimulating* causes. Many causes, however, cannot be said either to depress or stimulate solely; they exert a peculiar action, which is not to be thus explained. It is something we do not understand. For example, malaria, which produces ague, is a certain agent perfectly unknown to us, except so far as regards the situation in which it is produced. Malaria produces a set of symptoms of so peculiar a nature, that we cannot say it is a mere depressive or contra-stimulating agent;—that is to say, though the first symptoms of ague produced by it are those of extreme debility, yet if we weaken the body to the same extent in various ways (as by bleeding and other means) we do not produce that train of symptoms known to us as intermittent fever. We therefore have stimulating, depressing, and physical or chemical causes;—which are sometimes called *stimulantes*, *contra-stimulantes*, and *irritantes*. We must not, in medicine, be very nice about the etymology of our words;—that is to say, we must employ words of a certain meaning, so as to be clearly understood; but we shall find words signifying something very different from what their etymology would lead us to suppose. Nor is this remark confined to Medicine; it applies equally to Anatomy; and our only object should be to become understood among ourselves;—to know what ideas are meant to be conveyed, when certain expressions are used.*

An *exciting* cause may become a *predisposing;* and a *predisposing*, an *exciting*. For instance, malaria excites ague. But a person who has been exposed to malaria, may not have ague till he accidentally gets wet through; and then this *excites* the disease, to which the malaria had only *predisposed* him. Again, if a predisposition continue to increase, disease will happen without any exciting cause. Plethora of the head may increase till a fit of apoplexy occurs,—without stooping, overloading the stomach, or any common exciting cause.

* This is a very *good* object, but it ought not to be the *only* object aimed at. The "expressions used" should, as nearly as possible, correspond with the "ideas meant to be conveyed."

Among the most common causes of disease, are aberrations with regard to six particular circumstances, which have been very strangely called *non-naturals*. The air we breathe, the food and drink which we take, the retentions and excretions, motion and rest, sleep and watching, and the various passions of the mind (which are all natural enough), are called by old writers *non-naturals;* and others, seeing the strangeness of this expression, have called them *things necessary to life;*—that is to say, things which are necessary in order to the continuance of our existence. The great sources of disease are an aberration from that state of all these which conduces to health. For example, with respect to air; vitiation, I need not say, produces a variety of diseases; such as fevers, and many others. I need not say how much our health must depend upon the wholesomeness of our food and drink, and upon a proper quantity of them. I need not say that the body cannot bear more than a certain degree of exertion,—that many diseases arise from fatigue; and that, on the other hand, excessive rest and indolence produce a collection of fluids in various parts of the body,—stagnation, plethora, fatal dropsy, and various organic diseases. So with respect to sleep and rest, alternations are absolutely necessary; and we every day see persons who, for want of sleep, become the victims of fever, and gradually of the most destructive diseases. And so with respect to the passions of the mind;—there is scarcely a disease (with the exception of those that depend upon contagion) to which they do not give rise; nor is there any one part of the body, in fact, exempted from disease through the passions of the mind. No one can imagine what a vast number of diseases, not only functional but organic, arise simply from unpleasant passions of the mind;—that is to say, from grief and deep-rooted sorrow, from violent anger, from regret and chagrin, and all those feelings which are of an unpleasant character. On the other hand, it is also to be remembered, that passions of the most agreeable kind,—excessive joy, for instance,—may have almost as injurious an effect, as those which are of an opposite character.

With respect to the first of these non-naturals, the *air*, it may injure the body by its weight or levity, by the various electrical qualities which it may possess, by its temperature. by its dryness, and by its moisture. Various winds have various effects upon the human body of the most curious kind, according to the countries, or districts, or parts, over which they pass. With respect to temperature, it injures the body not only by its height or lowness, but also by its vicissitudes; and not only so, but accordingly as it is applied partially or generally to the body. A temperature that would do no harm if it were continued, would be productive of serious mischief if it suddenly succeeded an opposite temperature. A temperature which would do no harm if applied throughout the body, frequently does great harm if applied partially. Every body knows the danger of suddenly cooling, if the body be over heated and fatigued; and of

a draught applied to any one part of the body. Included, perhaps, under the head of *air*, may be mentioned various effluvia and various odours; as they are transmitted through the air.

Upon *food and drink*, another source of disease, I need say but very little; they may be injurious either by their quantity or quality.

As to what are called *excreta* and *retenta*, let us speak first of retenta. The great thing here alluded to by old authors, is the blood; and it was supposed formerly, that it might greatly injure the body mechanically by its excess, either absolute or relative; so that *plethora* formerly occupied a very prominent part among the causes of disease. You will find some curious distinctions made by old authors on the subject of plethora. They called it absolute or true, or *ad vires*, or *ad vasa*, when the quantity of blood was absolutely in excess; they called it *apparens* when the blood was in its natural quantity, but expanded. They fancied it might be expanded by heat, and in that way a temporary plethora be induced. Plethora, too, was divided again into a third variety—*relative*. When there was no actual increase of blood, when the blood was not expanded improperly by heat, but when the space in which it moved had become too small, this was called relative plethora, or *plethora ad spatium;* where the vessels, it was supposed, became contracted, and the blood was in excess to merely the contracted space. Plethora, however, certainly may be either *general* or *local*. A local plethora is what in modern language is called an inflammation or congestion, just as the case may be. When the blood is really in excess, I believe that it is generally of too rich a quality; that there is too little of its watery portion, and too much of the crassamentum. I need not say, that the opposite of plethora is *inanition*. This is a state which is induced by excessive discharges, or from the want of food; so that the blood which was in the body is let out, or the blood which naturally escapes in the various excretions is not replaced. Anæmia, or bloodlessness, but more properly a watery state of the blood, will arise from an ill understood, I may say, not at all understood, state of the system; in which, although food is taken, nourishment is but very sparingly extracted from it. Cases of this description are seen continually: chlorosis is one of this kind. But the blood certainly is sometimes in fault with regard to its constituents; not merely as to whether it is too rich or too poor, but (as would appear by some recent experiments of a friend of mine, Dr. Stevens; who is about to publish a work on Fever; and of Dr. Clanny,)* by the saline ingredients erring in quantity; so that the blood, in many cases of disease, is absolutely deficient in its saline particles. It is evident, however, that diseases of the solids themselves will sometimes cause these aberrations of the blood; so that the blood itself is not the cause of the

* These works have since been published; and are entitled, "Observations on the Healthy and Diseased Properties of the Blood; by William Stevens, M.D.;" and "Hyperanthraxis, or the Cholera of Sunderland; by William Reid Clanny, M.D."

disease. It may become an instrument of farther disease; though disease of the solids originally may have given rise to the aberration of the vital fluid.

With respect, however, to the *excreta*, you may easily conceive how excessive discharges will occasion various diseases. The excessive discharge may consist of blood, of bile, of secretion from the alimentary canal—fæces, of urine, of perspiration, of saliva—that, however, seldom does much harm—or of semen. These are the fluids which particularly escape from the body, and the escape of which may do harm. But with regard to the latter,—the discharge of semen,—although one must suppose that the simple excessive loss of the fluid must be injurious, yet it is very certain that the mode in which that fluid is lost, exerts a very great influence upon the constitution.

In regard to *motion* and *rest*, I need not point out the ill effects of sluggishness on the one hand, or of fatigue on the other. Nor with respect to *sleep and watching*, need I make any remarks; for they come under the same head as motion and rest;—sleep and watching being to the brain, what repose and motion are to the body.

With respect to the *passions of the mind*, I mentioned that they are a frightful source of disease;—much more so than is commonly imagined. An immense number of cases of disease of the heart, and disease within the abdomen, as well as of the brain itself, arise, I am certain, from unpleasant passions of the mind. However, it is not merely *unpleasant* passions that effect the body injuriously; violent emotions of the most *pleasurable* kind, will sometimes operate in the same way. History relates many accounts of persons who have died from excessive joy.

Besides those circumstances, however, which I have just mentioned, the body is liable to injury from two very common sources; one of which is *poison* of various sorts; which poison may enter the system by the surface, by the breath through the medium of the lungs, or by being swallowed; and it is a very curious fact, that many poisons which act offensively when admitted into the body one way, have no effect when admitted in another. I believe it is a fact, that the poison of hydrophobia, or the poison of a serpent, may be swallowed with the most perfect impunity.

In addition to poison, the body suffers much from *mechanical injuries*. Mechanical injury, of course, is a cause that may affect almost any part of the body.

Among the *causes* of disease which chiefly act by giving a predisposition, we may mention that of *age*. All periods of life are subject to their own diseases; whether we divide them with Shakspeare into seven, or with those authors who mention five, or those who mention more. Every age is particularly liable to certain diseases. For example, you rarely see gout in an infant; nor is it common for old persons to have the symptoms of acute hydrocephalus. In short, every age seems marked out as particularly liable to be, if not destroyed, at least impaired, by particular diseases. The same is

the case with respect to sex: each sex is particularly liable to its own affections. Hysteria, which occurs only now and then in the male, occurs far more frequently in the female; and even when there is no reason to suppose an affection of the uterus. Of course there are certain diseases which can affect but one sex.

As to temperament, disease depends much upon it. We are all of some temperament, or some combination of temperaments; but excess of one temperament gives a great liability to disease. You know that the usual divisions of temperaments are four;—the sanguineous, the melancholic, the phlegmatic, and the choleric. The *sanguineous* is marked by smoothness of skin, softness of hair, a quick pulse, a warm surface, great excitability of the whole frame, and generally a fair skin with florid complexion. The *melancholic*, on the other hand, is marked by a slow pulse, a dark swarthy complexion, dark and strong hair, and less susceptibility of emotion,—that is to say, of sudden violent emotion; although, when certain emotions take place, they are said to be more continued. The *phlegmatic* is marked by torpidity, paleness, and flabbiness. The *choleric* is characterized by reddish hair, and great excitability. However, these divisions, made by the ancients, are not so much attended to now. We certainly often see these temperaments strongly marked; but they are all infinitely combined.

An attempt has been made, within these few years, to divide temperaments differently; according to the activity of particular parts. For instance, some persons have the chief activity in the head. They have a large intellectual development of the head, as some people say; and that would be called, perhaps, the *cerebral* temperament. Others, again, have a large broad chest, with a considerable development of all the muscles; and this is called the *thoracic*, or *muscular* temperament. Again, others are sluggish,—prone to eating and drinking, with large bellies; and are said to have the *abdominal* temperament. Now it is rather an abuse of terms to call these states, *temperaments;* for I think the word "*temperament*" rather refers to the constitution and character of the frame altogether. Yet there is no doubt that these divisions occur; for you see some persons all intellect, others all muscle and chest, and some portly, with their big bellies and lean pates,—their heads suffering in proportion. In truth, Dr. Thomas entitles his work,—"Physiologie des Temperaments ou *Constitutions.*"

However, whether you choose to call these conditions, *temperaments* or not, it is well to know that these persons will suffer various diseases, according to the division under which they come; just as is the case with regard to those who are of a sanguineous, phlegmatic, choleric, or melancholic temperament. They will be particularly liable to diseases of the head, if they be of the cerebral conformation; they will be subject to affections of the chest, not of a phthisical, but of an inflammatory kind, if they have a full thorax; and of course they will be subject to various hepatic, and other abdominal diseases, if the abdomen gain the sway. It is worth

while to attend to this other division of temperaments; although, perhaps, the term itself may be objectionable.

Besides original temperament, acquired peculiarities take place by a long residence in a particular climate. By long residence in a particular spot, certain dispositions of the body are engendered; and a second nature, if I may so say, is produced. The various occupations of life have the same effect;—the various trades have their various diseases. On this subject you cannot, I believe, read better works than Ramazini's* and Thackrah's.† Custom and habit, whether referable to trade or situation, or action, or any other circumstance, have also very great effect in producing or in preventing the cure of disease. For example, if a person be in the habit of dram-drinking, and has a sore, nothing is more common than to see that sore not heal, in spite of the best surgical treatment, till the person is allowed his dram. After a surgical operation a person has been known to sink, through the surgeon's not having been aware that the individual had indulged in some bad custom, until it had become a bad habit. From the want of a patient being allowed a quantity of gin in the course of a day, he has died after an operation; whereas he might otherwise have done well. This has been strikingly shewn in other cases, where the knowledge was happily attained; and a good allowance of gin, after some severe accident, has caused every thing to go on well, though the patient at first appeared sinking. Bad habits are, therefore, sometimes to be *indulged;* although they should certainly never be *acquired.*

Independently of what is called *temperament,* an individual may have a particular disposition not acquired; it may be born with him, and be hereditary. A peculiarity is sometimes so exceedingly singular,—so totally different from what we observe in other people, that it is called *idiosyncracy.* It is nothing more than a peculiarity, either original or acquired by habit; and sometimes it is only connate, while sometimes it is hereditary. As an instance of this, you will sometimes find a person who cannot eat a certain article of food. I recollect seeing a young woman who could eat the hardest salt beef, and digest it well; but if she took a raspberry, or currant, or any fruit, she was instantly thrown into the most violent spasms of the stomach; so that a stranger would have fancied her life in danger. These are called *idiosyncracies;* and it is of great use to know them, because some persons are peculiarly affected by certain remedies; and that which is a proper remedy for the disease, may be improper for a particular patient.

So much, therefore, with respect to the causes of disease in general,—general *ætiology;* and I will now proceed to consider the third branch of general pathology,—the symptoms of disease in general, —*semeiology* or *symptomatology.*

I believe I mentioned that *symptoms* comprehend everything which is observed in a patient out of the course of health;—*singulæ quæ in*

* "Treatise on the Diseases of Artificers," translated by Dr. James.

† "Effects of Arts, Trades, and Professions, on Health and Longevity."

ægro præter naturam observantur res. The most evident, and the most constant of these, are put together; and are said to constitute the disease. You will recollect that the disease is not the *cause* of the symptoms; but that the disease is the *collection* of symptoms. I mentioned this, and illustrated it with respect to jaundice and to epilepsy; the outward signs of which are jaundice and convulsions, while the inward state is the proximate cause.

Now these symptoms may be *essential*,—they may be what is called *pathognomonic*, or they may be *accidental*. The *essential* symptoms of disease, are those which are necessary to make the disease,—to constitute the idea of the disease. You cannot, for instance, suppose a patient to have pleurisy, unless there be a degree of feverishness, with sharp pain of the side, increased upon respiration, together with a cough. These symptoms would be called the essential symptoms of the disease; yet no one of them would make the disease. A patient may have feverishness without pleurisy; or a sharp pain in his side without pleurisy, because it may be muscular or it may be neuralgic; or again, he may have cough without any pleurisy. These are then, you perceive, essential to the disease altogether, but no one of them constitutes it. If, however, a symptom be so important to the disease that this cannot be present without it, then it is called *pathognomonic*—a symptom without which you could have no conception of the existence of the disease. There are, however, but very few of these symptoms. In jaundice, the yellowness of the skin, of the sclerotica, and of the nails, is pathognomonic. Without making any farther inquiry, you may be sure that the patient labours under jaundice; but in general we make out the disease from the groups of essential symptoms, and from taking into consideration every circumstance of the case. Besides these symptoms, others are *accidental*. Many cases have symptoms which are merely accidental, and are not at all necessary to the disease. The disease has frequently existed without them.

You will find symptoms also spoken of as *positive* and *negative;* and it is of great use to attend to the latter. A negative symptom is, perhaps, an improper expression. A symptom must, properly speaking, be positive; but, from the absence of certain circumstances, of certain symptoms, you frequently make out the nature of a disease. If there be two diseases with certain symptoms common to both, but one of them has a symptom which the other never has, then, if that symptom be absent, it enables you to make out the true nature of the case. Hence the absence of certain symptoms is frequently of as great importance to be attended to, as the presence of others.

Now, from the presence of the symptoms chiefly, but not entirely, we make out the character of the disease; and the determination of the character, the name and nature of the disease, is called the *diagnosis*. To speak again of jaundice; from the yellowness of the skin, the whiteness of the fæces, and the dark colour of the urine, you make your diagnosis, and say the disease is jaundice; although, indeed, you may do so merely from the yellowness of the skin and

of the sclerotica. But you will frequently find that your diagnosis is not easily made from the symptoms alone. You must look into the exciting and predisposing causes of the disease; you must ascertain what predisposition the patient is likely to have; you must also ascertain to what exciting cause he has been exposed; and then conceiving what it is likely would ensue, and observing what actually has ensued, as far as you can judge, you are enabled much better to form a conclusion as to the real character of the affection. You will find your diagnosis also materially assisted by attending to the history of the case;—not merely observing the symptoms that present themselves to you, but inquiring carefully of the patient the whole story from the beginning. You will thus ascertain whether these circumstances confirm what you suppose to be the nature of the case. You will also find it of great importance, in making out the character of the disease, to learn the effects of any previous treatment that may have been adopted. If you learn that vigorous treatment has been employed, and has had no effect whatever, you will doubt very much as to the propriety of the view which has been taken, with respect to the nature of the affection. In making a diagnosis, all these points are to be scrupulously attended to.

It is in making an accurate, careful diagnosis, that the medical practitioner chiefly shines. When the nature of a disease is once ascertained, it is no difficult matter to treat it. Other qualities of mind are then required;—frequently only courage, or mere perseverance; but it is in making a diagnosis,—in ascertaining the character of a disease, that the scientific practitioner outshines the inferior. Unfortunately this is a point not attended to as it ought to be. Many persons pride themselves in being good practitioners; because, without knowing what is the matter, they can say what will do good. It is an unscientific way of proceeding; and, even if I could not practise better for making a good diagnosis, still I would be as particular on that point as possible, for the sake of observing a good general rule,—for the sake of endeavouring to treat the patient better than I otherwise could, notwithstanding all my conceit; and for the purpose of being ready to meet any unexpected emergency that might arise. A medical man who will not take the trouble to establish a diagnosis, is just like a surgeon who will not condescend to learn the anatomy of hernia; but who says that he knows if he cuts this way and that way, he shall liberate the entangled parts, and accomplish the operation as well as the best. I have witnessed this; but, then, what are such men when a difficulty arises? They are lost in perplexity, and glad to apply to those who know better. It is impossible to be too minute in making a diagnosis.

You have not only to make a diagnosis as to the general character of the disease, but you have to ascertain what variety of the affection it is;—whether it is one with strength or weakness; and to weigh the minutest circumstances respecting the case. This is,

perhaps, an exercise of patience; but it is an exercise highly gratifying;—especially when you find you have made a correct diagonsis.

The judgment you form as to what will happen in a case, is called *prognosis.* In order to make a very correct prognosis, it is best to make an accurate *diagnosis;* for if you do not know what the affection is, you will often be unable to tell how it is likely to terminate. For the sake of making a prognosis, you must observe all the symptoms, and learn the history of the case,—exactly as in making a diagnosis; but there is something more to be done than that. You must know the direct tendency of the disease;—the course which the disease is always inclined to run;—the course which it is likely to run in the particular individual, according to age, according to sex, according to previous habits,—according to all those circumstances which I have previously mentioned, as to individual peculiarities; and accordingly as you have it in your power to put into practice requisite curative means. There are some cases in which, if we were allowed to practise our art freely, we should make a favourable prognosis; but in which our hands being tied, (as they are when others ill informed or inactive are called in over us), we must give an unfavourable prognosis; simply because the patient must be allowed to die. In making a *prognosis,* there is frequently less skill required than in establishing a *diagnosis;* for some persons, with a sort of tact, will tell whether an individual is in danger or not, without knowing what is the matter with him. Many persons who have no knowledge of medicine, or at least very little, have such strong perceptions, that, from the aspect of an individual, and from general observations of their own, they are enabled to give a very correct prognosis, either favourable or unfavourable. This I know to be the case. There are a great many intelligent officers who, from seeing their men fall around them in battle, and sick in hospitals, have become, in one sense of the term, good doctors; and though they are not able to cure the disease, or tell what is the matter, they will be able to give a shrewd and correct guess as to how matters will turn out. But although some people, by nature, are well qualified for this, while others are not, yet the medical man must be taken as he is; and whether he does or does not possess sufficient natural sagacity to make an accurate *prognosis,* it is his duty to make as careful a *diagnosis* as he can; in order that he may make as good a prognosis as possible. If his intellect be not of an acute description, yet, by knowing the case, and by the aid of science and minute observation, he will be able to form as good an opinion, as the man who by nature is qualified for these things; and if with science and observation be combined native sagacity, then I need not say that his prognosis will be much superior to that of the individual, who trusts alone to his natural powers.

You see therefore what is meant by *diagnosis,* and what by *prognosis;* and I cannot urge upon you too strongly the most careful attention in establishing the former. Whether you can cure the

patient or not, you should make it a solemn rule to investigate the case to the utmost. It is only by this that we can profit ourselves, or that those who come after us can profit. If we be not careful, we cannot advance science; and the next generation will be none the better for us.

There is a term which I have not yet explained, or even mentioned;—namely, the word "*diathesis.*" When the body is particularly predisposed to any kind of affection, it is said by some to have that particular *diathesis*, or a disposition to it. However, you will generally see this term limited to imply two states;—an inflammatory state; and a state of weakness, or debility, if not of putrescency. You will hear the one called the *phlogistic*, or *sthenic*, which you know means strong; and the other called the *asthenic*, or weak. When a person, for instance, is in a high state of excitement, with a full and strong pulse, and increased heat of body, labouring under any particular complaint, he is said to have the *sthenic* or *phlogistic* diathesis;—in fact, an active inflammatory state of the body. If, however, the state be one of debility, so that any disease which is actually present is attended with weakness; and still more if there be extreme collapse, and a disposition to putrescence, then it is called the *asthenic* diathesis. I believe, in modern times, these terms are rarely used, except when a certain disease is present; so that they really imply, not the disposition to disease, but the character of the disease;—and, indeed, as to whether it is actively inflammatory,—attended by strength, or whether it is attended by weakness; but even of these two, you seldom hear persons speak of either in this country, excepting the phlogistic.

I may mention that the word "*diathesis*" is used by old authors in other senses;—to signify, for instance, the general disposition to disease at any particular season; so that the constitution of the period was said to be its diathesis. If the disposition of any particular season of the year,—not the regular seasons,—was to produce such and such kinds of disease, the word "*diathesis*" was applied to that disposition;—to the disposition, if I may so speak, of the atmosphere at the time. But, generally speaking, the word is used as I have pointed out above. However, you will sometimes find a constitutional disposition to certain diseases, when present, called a diathesis. For instance, it is not uncommon, in practice, to hear persons talk of a "scrofulous diathesis." Where a person has every look of scrofula, with its actual presence in one part, you will hear individuals say,—"that is a scrofulous diathesis." A disposition to many other kinds of disease, when present, is sometimes called a diathesis; but it is the *phlogistic* diathesis of which we hear the most.

This term is sometimes used to signify that full state of the body, which would render a person very liable to an active inflammatory affection; but is certainly more frequently limited to that state when the disease has actually begun. When a violent disease begins, and there is quickness and strength of pulse, and heat, the person is said to have the phlogistic diathesis. Now and then, persons with

merely a full pulse, are said to be labouring under the phlogistic diathesis; but that state is characterised more particularly by the word "*plethora*," of which I lately spoke.

With respect, now, to those symptoms of disease, on which the diagnosis and prognosis are in a great measure to be founded. The symptoms of disease may be divided, perhaps, in one point of view, into two kinds;—those which are discoverable by the patient only; and those which are discoverable by the by-standers also, or by them alone. There are some symptoms which a patient alone can ascertain; —for example, his feelings. He it is that feels the pain, and it is a lucky circumstance that it is so; for if the doctor felt the pain as well as the patient, there are but few who could stand the practising of the profession. We know little about the pain, except from the patient's account; and in many cases, in public practice, we are deceived. We have, however, only done our duty in listening to the patient's description.

With respect to *pain*, it is of various kinds;—it may be sharp,—stabbing,—darting,—shooting,—lancinating. These are all words used by patients. At other times the pain is not of this character, but dull; and then we call it an *ache;* and sometimes patients add the word "*pain*," making it *aching-pain.* Sometimes you will have pain described as *throbbing* and *pulsating;* and you will hear patients also complain of *pricking pain*,—as though a number of needles were being pressed against them. Now these things are all of great importance to be attended to, because they shew frequently the seat of the affection; and accordingly as a patient describes his pain, as sharp, or dull, or throbbing, or pricking, so you ascertain frequently whether he is telling the truth or not; because you see, for other reasons, a probability that, if he have pain at all, it is of a particular character; and you ascertain whether his account agrees with what you would, *a priori*, expect him to describe. You will sometimes hear pain spoken of as *smarting*, and a very high degree of this is *broiling.* In some affections of the abdomen you hear a patient complain of broiling pain. It appears to be a high degree of smarting, with a sense of burning.

If pain be increased by pressure, or by the application of stimulants, then we say there is *tenderness;* but perhaps the word "*tenderness*" is more properly restricted to pain increased upon mechanical pressure. There are other feelings continually described by patients; as, for instance, a feeling of *dead weight.* This is particularly the case with respect to the head. You will sometimes hear persons complain of *fulness*,—as if a part were excessively full; and now and then this sensation arises to such a pitch, that the part feels as if it would burst; and then we call it a feeling of *tension.* A feeling of tension, appears to be a high degree of a feeling of fulness. You will now and then have patients complain of a sensation of "pins and needles." It is very different from the sensation of pricking pain,— as if needles were being run in; it is as if the pins and needles were rather blunt. It merely gives the lowest sensation of this kind,—not

amounting to pain. Pricking pain is of a very different character;—for instance, that which people frequently complain of from inflammation of the urethra in gonorrhœa. They experience a pricking pain along the urethra. But the sensation experienced when the hands and feet are "asleep," is not called *pain;*—patients say they feel as if pins and needles were there. You will frequently hear persons declare, that they have an indescribable uneasiness in a part,—a sensation which nearly drives them mad; but they will not allow it to be *pain.* I have known this sensation occur in different parts of the body. I recollect one lady who had it in the neck; so that she was obliged to walk about the room, followed by a servant rubbing her neck, night and day. Unless this was done, the sensation nearly deprived her of her senses; and her countenance betrayed the greatest distress. You will find other sensations spoken of by patients;—a *creeping*, a *crawling*, or a feeling as if water were trickling down them. There are also symptoms which approach nearly to pain,—itching and tingling; which may be almost insupportable. Tingling is a high degree, I imagine, of what is called itching, united with a sense of pricking. With regard to other sensations, there is nausea felt in one part,—the stomach; and now and then persons have an excessive sensibility of one particular sense,—of the eye or the ear, for instance.

Now all these are symptoms which the patient alone can know any thing about. We all know something about them, because we are more or less ill at some part of our lives; but the medical attendant must take the patient's word for these sensations;—at least he cannot ascertain the existence of them directly. He can only ascertain, by other symptoms, whether the patient is probably telling the truth.

Besides these symptoms, people have a feeling of great exhaustion,—of great debility; and this is a point strictly to be attended to, in forming the prognosis in an acute disease; for sometimes it is a fatal symptom. When a patient, for example, after inflammation of the bowels, has no pain, but a feeble pulse; and complains that he is so weak, that he feels as if he should die,—that he never felt such weakness in his life,—you may be almost sure he will be dead before the next day. On the other hand, this feeling is very deceptive. Women are subject to a sinking sensation at the epigastrium. They tell you they feel as if they had no inside; and are sure they are about to die; but the feeling is quite delusive. You might in the former case, after an acute disease, judge from seeing all, or the greater part of the symptoms decline, that the patient would soon get well, and that this feeling of weakness was nothing more than might be expected after severe indisposition; but you must take into account other symptoms,—particularly the weakness of the pulse. But with respect to these women, you find the pulse good; and they are able to walk about, notwithstanding all the depressive feelings of which they complain. This is a very remarkable circumstance; and I shall find it necessary to draw your attention to it, when

speaking of diseases of the stomach, and of hysterical affections. Patients, also, can alone be conscious of drowsiness, want of appetite, *inordinate* appetite, and *depraved* appetite; although, with respect to many of these things, you can often, by other circumstances, ascertain whether they are telling the truth or not. It is to the patient, likewise, that you must trust for the existence of tenesmus and of strangury;—a frequent desire to go to stool, and a painful and frequent desire to make water. All these are instances of symptoms, of which you must receive an account from the patient himself.

There are some such symptoms, too, which are derived from other senses than those of general feelings; and these are referable to the *ear*. Patients will continually complain of the most violent *beating* pulsation in their head; and frequently, too, of a *snapping* and *cracking* there. Such symptoms undoubtedly do exist; but we can take no cognizance of them. With respect to *sight*, you must depend on the patient's account for the occurrence of flashes of light before the eyes; and for the symptom so common in many diseases,—moats floating before the eyes; and for double vision, or diplopia; and likewise for the symptoms of giddiness or vertigo. On the patient also you must depend for symptoms with regard to *taste*. Some have in their mouth a bitter nauseous taste, of which you cannot judge. So with respect to *smell*;—now and then persons experience a most disagreeable odour, which no other person can notice. There was a case of hydrophobia at Guy's hospital, in which there was an instance of an accidental symptom, and that a symptom to be ascertained only by the patient;—the patient experienced a most disgusting odour. You will find that this occasionally happens in cases of insanity. Now and then the smell which the patient perceives, may be noticed by other persons; because it arises from some disease within the nose.

There are still other symptoms, of which the patient alone can give an account;—defects in the senses;—a loss of sight,—of taste,—of hearing. For all these, you must depend much on his account. So with respect to many mental circumstances; such as the loss of many desires, and a feeling of strong desires;—for all these you must rely upon the patient. You see, therefore, that in regard to symptoms, they may be divided into two classes; the first of which comprehends those which are evident to the patient alone; and the second those which are perceptible to the practitioner also, or to him only. I shall proceed now to consider those which are of the latter description. In some writers, you find *symptoms* and *signs* distinguished from each other; but I think it mere trifling to dwell upon such matters. With respect to symptoms, however, those which others observe, of course the patient, for the most part, may observe likewise.

In observing the symptoms of disease, it is right to remember that Providence has blessed us with five senses; and all these five senses it would be ungrateful, as well as unscientific, not to employ. I am led to speak in this way, on account of its being a modern

practice to employ the ear extensively. Those who do so are laughed at as innovators;—as people who take unnecessary pains, and are perhaps attempting a piece of quackery, in order to produce an impression on patients.* At any rate they are laughed at; but it will be impossible for them to be laughed at long. If nature has blessed us with hearing, to observe certain phenomena around us, there can be no reason for not employing it, when we come to observe the phenomena of disease; and if it be a fact that symptoms take place, of the most useful nature, that are cognizable by the ear only, it is our duty to employ our ears for the purpose of detecting them. We are bound, I think, to employ all our five senses in the investigation of disease. The chief, however, of which we make use, are the sense of sight, the sense of hearing, and the sense of touch; but the smell, and in some instances even the taste, may be called in to our aid;—the smell, however, much more frequently than the taste. It would be as absurd to shut our ears, as to shut our eyes; yet, because the extensive employment of hearing has only been introduced lately, those who were not instructed in this point when they were students, are, some of them, too proud to learn in their old age; and are good enough to pity us younger men.

As to those symptoms which are cognizable by our various senses, they discover themselves in every part of the body, from the head to the foot; but the two parts which give the chief symptoms to the sight, and I may say to the touch, and the chief symptoms not only in reference to themselves but to all other parts of the body, are the *head* and the *hand*. It has become the custom, in all civilized nations, to cover all parts of the body except the face and hands; and these two parts afford far more information respecting the state of the body, and respecting diseases that are present, and not seated in these individual parts, but at a distance, than any others. It is certainly a striking coincidence; but we must remember that while necessity compels mankind to keep the face, and almost always the hand, uncovered, Providence has ordained that these same two parts shall convey the chief information to others, respecting our mind and body.

With respect to the face, we observe that it gives us two sorts of information;—first, as a mere portion of the body only,—a portion of the surface which is far more affected by every change, than any other excepting the hand, and therefore so far as it is *face*; and, secondly, it gives us another description of information so far as it is *countenance*,—so far as it expresses the state of the mind, and the state of the feeling altogether. The observations which you make upon this part of the body, then, may be considered as they respect simply *face*, and as they respect simply *countenance*.

With regard to the face, as really a part of the surface of the body, if there be fullness of blood, it is shewn particularly there. If

* This is not nearly so much the case now, as it was when these observations were delivered. The laughers have not found themselves on the winning side.

you were to take the same quantity of surface in any other part of the body,—the abdomen, back, or thighs,—for instance, you would not get the same information from the part, simply as surface, as you do from the face. If the body be at all full, you see it in the face. If the circulation be rapid, and the heat considerable, it is the face that shews it; for the cheeks become tinged much sooner than any other part. If there be the least degree of coldness, you perceive it in the cheeks, nose, and lips. You discover hectic fever in an instant, by the red patch upon the cheek. If the patient be labouring under difficulty of breathing, you find the eyes immediately suffused; you find the lips more or less livid, and the whole face frequently of a leaden hue; sometimes, indeed, I have seen it black. If it be jaundice that the patient labours under, you discover it instantly in the face. By one part of the face you will detect it, long before it appears in any other part of the body, except the hand; and when the disease has nearly declined, it is in the face as well as in the hand, that it lingers the longest. In the white of the eye you perceive the presence of jaundice, before it is apparent any where else, except at the root of the nails. If the patient be bloodless, you first discover it in the paleness of the face, the want of the usual vermilion of the lips, and the absolute paleness of the tongue. There is not a white crust upon the tongue, but that organ is absolutely blanched. Two of the chief marks of scrofula are shewn in the face; —the dilated pupil, and the tumid under lip.

Then, again, in the *tongue* you have an immense number of symptoms. The body cannot labour under inflammation in any part, but the tongue becomes affected by it. If there be strength, generally the tongue becomes white; if there be inflammation within the stomach and intestines, it frequently becomes red,—red at the tip, red at the sides, perhaps red all over; and perhaps there are red stripes upon it. If the stomach be simply in a state of dyspepsia, and the bowels confined, you have the tongue covered with a yellow thick mucus. The indications of the tongue are innumerable; they have been observed from the remotest ages; and no one would think of finishing his attention to a patient, without looking at that organ. The tongue sometimes will become brown, sometimes it will become absolutely black. In what are called putrid diseases, where there is a high degree of debility, and a disposition to putrescency, the tongue will become black. In other cases it will become glazed throughout, shining, and glassy; and in this state it will frequently be cracked into the bargain. In other diseases, again, as, for instance, in *delirium tremens*, it is frequently covered by a creamy mucus;—not a thick yellow mucus; but a mucus more like cream than any thing else, and so liquid that the tongue is moist. I need not insist upon the great importance of that part of the face or head —the tongue.

Then, again, if we take the *eyes*. We discover in a moment whether there is great excitement of the brain going on, by the sparkling of the eyes, by their rednses, and by their being watery.

We can discover whether a person has headache, by the oppression shewn in the eyes; and in some affections of the head, the eyes squint—are contorted in various ways. Frequently, too, when a person is asleep, he does not completely close his eye; and that is often an indication of disease. Then, again, the state of the pupil is very characteristic of many affections of the head. If you take the eye altogether, there is generally an appearance of brilliancy, or of dulness; or if you take particular parts, there is a dilatation of the pupil, or on the other hand, an extreme contraction; and all these things it is of the highest importance to observe, because they point out particular affections. For example, if you take apoplexy, you see the pupil usually dilated, and you know that there is great oppression of the brain; but if the pupil be amazingly contracted—reduced to a pin's point, you may almost to a certainty say that the patient will die: I do not say it is *absolutely* certain, because it is wrong to speak positively. If a person have taken opium in a large quantity, there is the same effect produced—generally a great contraction of the pupil; and where you are not with certainty informed of the patient having taken this narcotic, the appearance I have just described will assist you materially in forming the diagnosis. Then besides the strabysmus, and the open state of the eye during sleep, you have contortions in various instances; particularly if a child have convulsions of another part of the face,—convulsions of the muscles of the lower jaw; so that he gnashes and grinds his teeth together during sleep, and his eyes roll.

From the state of the *orbit*, or at least the contents of the orbit around the eye, you judge of the extreme debility, exhaustion, and emaciation of the patient. If the parts around the eye become absorbed, the eye sinks back in the orbit, and a hollowness is produced, which is characteristic of extreme exhaustion and inanition; and this alone will enable you to say, in a moment, how much worse the patient has become.

From the face *altogether*, simply as a part of the body, you are able frequently to tell at once that the lungs are affected, or that there is a great disposition to affection of the lungs. It is impossible sometimes to doubt for a moment, that if the patient be not labouring under phthisis, he soon will. From the peculiar appearance of the countenance altogether, particularly from the appearance of the eye, its transparency, together with the languor of the cheeks, or the flush upon them, no doubt can exist as to the nature of the disposition. And with respect to other parts, you can tell that the patient is labouring under organic disease of the abdomen, from the look of the cheeks. I do not say it is so always; but the appearance of the face is of great use in enabling us to detect that circumstance.

In organic diseases of the stomach, intestines, and surrounding parts, you have often a faint greenish yellow appearance of the face, something like that of a faded leaf, with minute vessels; not forming a patch of red, as in hectic fever: but reticulated, like net-work, on the cheeks. Where you observe this, there is generally some part

of the abdomen in a state of organic disease. You discover in a moment the strength of a patient by his countenance. When you are attending a case of fever, there is frequently no occasion to ask a question: you can tell whether a patient is better or worse, by viewing his countenance. So with respect to many other diseases;—when the patient is getting either better or worse, you can tell immediately by his face, what change has taken place subsequently to your previous visit. Every body makes this observation; and hence, when an individual meets a friend, he tells him that he looks well, or he is sorry to see him ill. If the appearance of the face be so characteristic of the state of an individual's health, even in the judgment of an inexperienced person, how much more so must it be in that of the medical man, who studies minutely every shade of change and difference that takes place in each particular part!

Speaking of convulsions of the face,—such as squinting or contortions of the eye, or a grinding and gnashing of the teeth,—I may state that there is one set of convulsions about the mouth, mentioned under the term "*risus sardonicus.*" It is a horrid sort of grin, which you often see in persons who are about to expire. To me it is the most terrible of all sights. It has been thought to characterize inflammation of the diapragm; but I do not know whether that is the case;—inflammation of the diaphragm is a rare affection. It is common, however, for persons at death's door to grin frightfully. The phenomenon receives its name from a herb of a poisonous quality, which grows in Sardinia; and is said to produce in those who eat it, this horrid contortion of the mouth, just before death.

You likewise see a singular appearance of the countenance, mentioned by almost every writer, under the title of "*facies hippocratica.*" It is the usual appearance of the face, immediately before death; when the body is at last completely exhausted, and life about to be resigned. It is so called, because Hippocrates gave a most accurate description of it. His description is,—"sharpness of the nose; hollowness of the eyes; collapsed state of the temples; collapsed and contracted state of the ears; the edges of the nostrils everted; the skin of the forehead firm, tense, and dry; paleness of the whole face, perhaps even blackness, or a livid and a leaden appearance." These are the characteristics of the *facies hippocratica.* When you see a person dying from a disease that has exhausted him gradually, this is exactly the appearance of the face.

I may mention (although it is not in regular order) that among the symptoms of phthisis, one is taken from the teeth;—not that all phthisical patients have the same state of the teeth; but in many there is beautiful whiteness of the teeth, with a degree of transparency and brilliancy, comparatively seldom seen in persons who are not disposed to phthisis.

Speaking of eruptions, I may mention that exanthematic and acute inflammatory cutaneous diseases, shew themselves much better on the face, for the most part, than anywhere else. It is on the face first that you discover a child is going to have the measles. When

a child is in a state of pyrexia, and you are sure it is going to be ill of something or other, the face will first disclose it, if it be the measles. There you have the running of the eyes,—there you have the fullness; and the first papulæ that present themselves, are generally seen on the face. Most acute cutaneous diseases attack the face among the earliest parts; or if they do not, yet the face, if affected, generally discovers the true nature of the disease better than any other part; the reason of which is, that the face is much more vascular than other parts. The cheeks are more or less inclined to be red, in most individuals; and the least feverishness reddens the face, more than any other part of the body; and therefore it is that acute cutaneous diseases, generally shew themselves best in that situation.

With respect to the face, simply as a part of the surface of the body, you discover paralysis in it more easily than in any other part. If a person be sitting still, you cannot tell whether his arm or his leg is paralyzed; but if his face be paralyzed, you will generally in an instant discover it, by the part affected being drawn to the opposite side, and perhaps from his inability to swallow his saliva. And so with regard to the tongue;—the moment the person begins to speak, you frequently in paralysis can discover the existence of the disease. The tongue frequently, in paralysis, moves to one side; but generally in an opposite direction to that in which the mouth is drawn. In fever, and other diseases, the tremor of the tongue is very characteristic. In general the whole body trembles; but the tongue does so particularly. In *paralysis agitans*, though the person lie still in bed, yet if he put out his tongue, it is seen to be in a great degree of tremor. In cases of dyspnœa and apoplexy, the tongue is swollen. But the face is particularly indicative of the general state of the individual's mind, and of the general state of the strength likewise; and we then, perhaps, should rather call it the *countenance;* and speak of the *countenance* instead of the *face;*—the "*countenance*" being the term generally used in reference to the state of the feelings. You will judge directly whether a patient is in pain or not,—whether he is suffering, by the countenance. In cholic, and in enteritis, the agony is so depicted in the countenance, that you discover in an instant that something must be wrong. I need not say that, in insanity, that passion of the mind which is predominent, discovers itself in the countenance. You may at once detect a good natured, a furious, a proud, or a desponding maniac. You may also discover much by the way in which his head is carried, to say nothing of his countenance. Those that are proud, carry the head upright; those that are cast down, carry it the reverse. But the countenance, independently of the position of the head, is indicative of the character of the disease; and again, an idiot is almost immediately discovered by the expression of his face. You ascertain in a moment, by the countenance, what the person's feelings are with respect to strength as well as to comfort; and what passions of the mind are predominant. You discover, as I before-mentioned, whether a person is better by

observing his face,—by noticing whether it looks fuller; but you discover much from the very expression of the countenance. You see, therefore, what a vast source of information is given by the face, not only with respect to affections of that particular part, but with respect to all other parts of the body.

Besides the general expression of the face, however, I must mention that you learn a great deal of the patient's feelings, by the attitude of his body. In fever nothing is a more unfavourable omen, than for a patient to be seen lying on his side at first, and gradually getting on his back, till he lies altogether supine; but when he sinks also in his bed, the case becomes still more alarming. The reason is simply this.—More muscular strength is required in order to lie on the side, than on the back, and to remain in a firm posture than to sink down; and therefore, when a patient sinks down, it is an indication that his strength is nearly exhausted. You discover a great deal, too, by the restlessness of the whole body. One of the most unfavourable symptoms, in many diseases, is extreme restlessness. You may have restlessness in women from mere fidgets; but in acute diseases, when great debility has come on, restlessness is often one of the fatal symptoms.

Of course, if disease take place in the face locally, it will show itself there as in other parts of the frame; whether it be swelling, mortification, local cutaneous disease, or whatever else may happen to it.

But to go to the *hand*,—the part which, together with the face, in all countries, civilized and uncivilized, is most exposed. In the hand we have very great indications; though certainly they are not so strong as in the face. The hand is one of the extreme parts; and shows the first fall of temperature. It is one of the first parts that become cold; exactly as the nose and ears do in the head. I believe the difference between its temperature in fever and in health, is often greater than the difference of the temperature of most other parts of the body. A cold sweat is shown in the hand, amongst the earliest parts; and the very hectic fever which flushes the face, flushes also the palm of the hand, and indeed the sole of the foot; but it is shown particularly in the palm of the hand, from the greater fineness of the integuments. Difficulty of breathing again, discovers itself by the appearance of the nails. If you observe in the difficulty of breathing a purple hue of the lips, a fullness and a leaden colour of the face, and a purplish colour of the eyes, you discover likewise a purple hue of the nails,—at least the parts under the nails. As I mentioned, in jaundice, that the disease appears first at the roots of the nails, as well as in the sclerotica; and that after the disease has disappeared from the rest of the surfaces you will discover it still lingering in the system by the yellownes, observed in the same two parts,—so, I believe, the changes with respect to the eyes and nails go on, *pari passu*, in dyspnœa. The dryness of the hand, its mordent heat, its clamminess, its firmness, and softness, the very grasp of the patient,—are all significant. If

phthisis is often seen in the eye, the ends of the fingers are no less indicative of it, or of some other internal scrofulous affection.

Besides all this, it is in the hand that we easily make the most important conceivable observations, upon the state of the circulation. It is in the hand, or at least at the wrist, that we feel the pulse much more easily than at any other part of the body. The same observation might be made any where else; but it would be done far less accurately, and with far less ease, than at the wrist. With respect to all other observations,—about temperature, about heat, about cold, about clamminess, and about sweats,—I think they are not only all made much more accurately in the hand than any other part, but that the hand appears to be affected by these particular symptoms, more altogether than most other parts of the surface of the body.

In regard, however, to the *pulse*, great indications of disease are taken from it. You will find the pulse generally spoken of in the first place, as great or small,—*pulsus magnus*, *pulsus parvus*; you find it mentioned likewise as strong or weak—*pulsus validus*, *pulsus debilis*; and as hard or soft—*durus*, *mollis*. A pulse may be large,—may be considerable, and yet not hard; a pulse also may be hard, and yet by no means large,—on the contrary, exceedingly small. A pulse is not necessarily strong because it is large; neither is it necessarily weak because it is small in volume. If a pulse be both hard and large, it is a strong pulse also; if a pulse be small and soft together, then it must be considered as weak. Mere softness may be such as to amount to weakness; and if it be exceedingly weak, you may extinguish it by the least pressure of the finger. This pulse has been called *pulsus vermicularis*; and among us *fluttering*, if it be also quick. It is a pulse easily recognized in practice, and, in many cases, indicates death to be at hand. If a pulse be exceedingly hard, and at the same time small, then it has been called a *wiry* pulse. A wire is necessarily fine and hard; and a pulse which has the same attribute, is called a wiry pulse. This is different from a thready pulse, just as thread is different from wire. A thready pulse is merely that which is small, soft, and weak;—a vermicular motion, hardly worthy of the name of a pulsation. It is chiefly in violent inflammations of the abdomen, that you have the wiry pulse; however, you must not depend upon the pulse only in such cases. If there be other symptoms of inflammation of the stomach, or intestines, or peritoneum, you must not say that is not the disease because the the pulse is not wiry. These are the qualities of the pulse, with respect to its volume, solidity, and force;—large or small, hard or soft, strong or weak.

But there are other varieties of pulse, taken from its *rate*. A pulse may be quick, and a pulse may be slow; there is the *pulsus frequens*, and the *pulsus rarus*. The pulse will sometimes go up to 160; sometimes it will go beyond that, so that you cannot count it, especially if weak; but then you can ascertain the state of the cir-

culation by the heart, where you can count 200 and upwards with perfect ease, when you cannot count the pulse at the wrist. You find a distinction made with regard to a frequent pulse;—you find a *pulsus frequens* and *a pulsus cœler*. *Frequens* is where there is a large number of strokes in a given time; and *cœler* is where the strokes take place in a short and abrupt manner. *Pulsus frequens* and *pulsus rarus* are opposite to each other; the former being a rapid, and the latter a slow pulse. The opposite of the *pulsus cœler* is the *pulsus tardus;* in which, whatever number of beats take place, they occur in a gradual manner. In England practitioners calls this pulse a *jerking* pulse;—"*jerking*" and "*sharp*" are our terms corresponding to *cœler* in regard to the pulse. No matter whether it is quick or not, we say it is a sharp or jerking pulse; whereas, on the other hand, that which takes place as it were deliberately, is called *pulsus tardus*.

I may mention the great importance of feeling the pulse at both wrists. If you feel the pulse at the left wrist only, you may often think that the patient, from extreme debility, cannot bear bleeding; but if you feel it at the right also, you will frequently form a very different opinion. Nothing is more common than for the pulse at the two wrists to vary exceedingly; and it is the pulse at the right wrist that, in the greater number of cases, is the correct guide. The difference is so great in so large a number of cases, that it should be a general rule to observe both pulses. I never myself have seen the pulses different in point of *time;* but there is a great difference in respect to *force*. It is also certainly right, in cases of great nicety, where you are in doubt as to the means you are to use, to examine likewise at the heart; and in cases of local disease of that organ, it is also right to examine the heart itself; for, in some diseases you will have simply, from an affection of the heart, a very violent pulse, such as would lead you to bleed to a great extent; and in those cases, the pulse is not an indication of the general strength of the patient, but receives its character solely from the disease of the heart. On the other hand you will, in some diseases of the heart itself, find a very small pulse; and on examining the heart, you hear it beat violently; but, owing to a diminution in the aperture, the blood escapes in small quantity. It is not only right to examine both wrists where there is great nicety required; but I advise you also to listen to the heart.

I should likewise mention, with respect to the pulse, that its rate, size, and force, are sometimes irregular; it will vary in its strength and size at different beats, and it will also vary in its frequency. You will sometimes have a pulse merely irregular,—beating always with nearly the same force, but beating at an irregular rate; and that is an irregular pulse in the common acceptation of the word; but besides that, you frequently find it irregular in force, size, and frequency; so that it will give a great thump or two, and then you have a number of strokes of no strength at all, and then again it will

beat violently. Irregularity, therefore, you must remember, does not refer to frequency only, but likewise to force. Sometimes the pulse intermits.

You must also of course remember, as physiologists, that the pulse differs in every age; that the younger we are, the more quick is the pulse; that the pulse of the female is quicker than that of the male; and that, generally, the inhabitants of a warm climate have a weaker pulse, than those in a more temperate latitude. It is necessary to take all these things into consideration; because, if you were to find the pulse of a child 120, and that of an adult labouring under fever likewise 120, you would commit a great error in supposing that the child likewise laboured under fever. It is necessary, therefore, to remember that the pulse varies according to age, sex, and climate; and that in young children it is particularly quick. I had an instance of the great use of examining a patient in bed, and not being contented without what is contemptuously called a mechanical examination, in an enlargement of the abdomen. I was called to visit a lady in the family way, about thirty years of age, whose pulse was about 80 or 90; but on listening to the abdomen—she being single, and having some disease, as she said—on listening to the abdomen, there was another pulsation about 128. The pulsation did not arise from any of the branches of the iliac arteries;—that was impossible; for if they had beaten, it would have been at the same rate as the pulsation at the wrists. She had a pulse of 80; something within her had a pulse of 128; and what that was, I left her to settle by herself. Being a single lady, all that I could say was, that if she waited patiently, the whole of the disease would come away to a certainty, in two or three months.

The pulse has been called, in the most ancient times, *res fallacissima*,—the most false of all symptoms; but the truth is, *all* symptoms are delusive, if taken separately: it is the collection which enables us to form our judgment. The varieties which I have mentioned, are sufficient for all practical purposes; and are the only ones that I have observed. You find in books an extreme *minutia* on this point, and I think a great deal of absurd trifling. It is the Chinese, I understand, who have made the most minute observations on this subject. They describe all sorts of pulse; such as, I dare say, no one ever observed, and such as no one ever will.

Now as to these two parts of the body,—the face, or rather the head altogether, and the hand,—our observations upon them are chiefly made by sight and by touch. However, there is another sense that may be employed with respect to the head; and that is the sense of smell. The breath that proceeds from the mouth, has sometimes peculiar odours; which, if we do not take pains to notice, we are at any rate compelled to observe. The head and the hand, of course, give all the symptoms common to other parts of the body, when they themselves are affected. When either of these parts is inflamed, the various local symptoms present themselves. It is not, however, of local symptoms that I am at present speaking;

but of symptoms indicating the state of the other parts of the system in general.

To proceed, however, downwards;—the *neck* affords a certain degree of information, but not much. A long thin neck is frequently taken, in conjunction with other symptoms, as a sign of phthisis; whereas, a short thick neck indicates a disposition to fulness of the head and chest. The pulse in the neck is also an indication of different diseases. In many affections of the head, the carotids will throb violently, so as to be seen at a distance; and, in many affections of the chest, the same circumstance is observed. Here, again, you see the necessity of attending to more symptoms than one. When you see a great throbbing of the carotids, you cannot tell whether it arises from an affection of the chest or of the head, for they both give rise to it. The pulsation of the jugulars is likewise frequently an indication of thoracic disease; a difficulty in the transmission of the blood through the chest, will give rise to a great pulsation of the jugulars. I need not say that tenderness of the neck indicates various diseases. By observing tenderness in that situation, you may frequently ascertain the existence of disease in the larynx; when otherwise you might be doubtful as to the nature of the affection.

With respect to the *chest*, it affords us a vast source of information. Its sides and its shape indicate the general constitution. Phthisical patients generally have a narrow and flat chest: the chest is contracted in various directions;—shallow and flat in the front, and narrow at the sides. If a person be disposed to apoplexy, from mere plethora and congestion, and in gouty persons, the chest is disposed to be circular. Frequently the chest is deformed; and frequently it acquires an enlargement in various parts, from disease in the pleura. When a collection of water or pus, (particularly of pus,) takes place in the pleura, it is not uncommon to find the sides of the chest become enlarged. It is, therefore, frequently of great importance in thoracic diseases to strip the patient, and look at his chest; for you may frequently discover by the eye a slight deviation in its two sides, which you cannot observe by the touch. A deviation so slight, that it would escape you if you merely resorted to measurement, is frequently perceptible to the eye. Of course, the touch will give you considerable information with respect to tenderness; and also with respect to the state of respiration, and the state of the heart,—by the thrill which you experience. In some cases of difficulty of respiration, you find under respiration a thrill; and in certain obstructions of the heart itself, you find, on pressing over a part of the heart, a similar circumstance takes place, corresponding with the action of the heart. In some cases of aneurism of the aorta, and of diseases of the heart, you find by the hand a strong pulsation.

But although the sight and the touch give you this information, there is a third sense which imparts especial aid with respect to diseases of the chest; and that is hearing. The function of the lungs differs from the function of many other parts, in this circum-

stance. It is performed with a noise; and so, likewise, is the function of the heart. The functions of the brain and the liver go on without noise; but it is peculiar to the function of the lungs and of the heart, that a certain sound should take place. If this noise take place in health,—in sound physiology, you must expect that when the function of these parts is disturbed, the physiological sound will become pathological;—that the sound will be altered; and such actually is the case. If this be the case, it is our duty to attend to it; if it be not the case, let those who say so prove that they are correct. We declare it is so; and we ask those who entertain a contrary opinion to listen for themselves.

As to the lungs, you will sometimes find the healthy sound of respiration cease altogether. A lung becomes impervious at a certain part;—the air will not go through it; and this may arise from an obstruction to the course of the blood into the lung. But it may also arise from the lung itself becoming consolidated; or from external pressure of the lung;—the dropsical pleura preventing the lung from expanding. However, you may ascertain by this that respiration is not going on in that spot. Besides an absolute want of sound, in certain diseases of the chest, you have in others an unnatural sound;—the sound of respiration does not cease, but becomes strangely altered. You have information, also, not by listening only, but by striking. If you strike the chest, the nature of the lungs in health, causes a hollow sound to be heard. The lungs are filled with air, and a hollow sound is necessarily produced. If something takes the place of air;—if the lungs become consolidated, or filled with fluid, or surrounded by it; it stands to reason that, if you then strike that part of the lung, the air being absent, you will have a dull sound. This is actually the case. These things are physical necessities;—they occur simply from the common law of physics. They must occur; and if they do, we ought to observe them.

However, nothing would be more absurd than to attend to these auricular symptoms solely. The fault of those who merely employ the ear, in diseases of the chest, is just as great as the fault of those, who do not employ it at all. There is often a sufficient number of other symptoms to point out the nature of the affection, without employing the ear; but whether that is the case or not, it is as much our duty to attend to other symptoms, as to those that we learn from the ear. You will frequently, by looking at a patient while he is breathing, find what is the state of respiration. You find that, like the pulse, it is more frequent than natural, or not so frequent as natural;—we may have the *respiratio frequens* and *respiratio rara*, corresponding with the *pulsus frequens* and *pulsus rarus*. Now and then we find respiration performed suddenly;—the inspiration and the expiration are sudden; and that is called *celer;* and the opposite state, where the chest expands slowly, is called *respiratio tarda;*—corresponding with the *pulsus celer* and *pulsus tardus*. These things may be learned simply by the sight. The respiration undergoes exactly such alterations as the pulse;—it may be regular or irregular,

slow or quick, sudden or gradual. It may be deep or exceedingly shallow,—little air being taken in at a time; and, on the other hand, you may have a full respiration. It may be full and deep,—corresponding with a full and strong pulse. I do not mean to say that the pulse and the function of the lungs, take place synchronously; but, as you have in the pulse quickness and slowness, fullness and smallness, jirking and sluggishness, so in respiration we have frequency and slowness, shallowness and depth, suddenness and sluggishness, irregularity, and so on.

When respiration takes place with difficulty, it is called, in medical language, *dyspnœa:* and if it be so difficult that the patient cannot breathe unless he sit upright, then it is called *orthopnœa.* Orthopnœa is merely an intense dyspnœa.

Independently, however, of the frequency of respiration or its slowness, you may hear particular sounds. You may hear a wheezing sound, which is called *sibilous;* or you may sometimes hear it performed with a snorting sound, which is called *sonorous.* Even without putting the ear to the chest, or employing a piece of wood as an intervening substance, it may sometimes be heard when standing at a little distance.

With respect to the *voice,* that also affords you much information. The voice is frequently suppressed, faint, harsh, and shrill; and these various changes will indicate great debility; or they will indicate particular diseases of the lungs themselves, or of the larynx, or of the air passages at large. From listening to the voice with the ear in contact with the chest, or with the intervention of a piece of wood, or any similar substance, you will frequently ascertain that the voice does not sound as it sounds in general; so that you are able to say that an excavation exists in the lungs.

From a *cough,* too, we learn much with the naked ear; and the varieties generally enumerated are slight, severe, harsh, crowing, hooping, shrieking, tearing, hacking, loose, and dry. There is an infinite variety with respect to coughs. Slight, severe, crowing, and hooping varieties, I need say nothing about. You occasionally hear a cough "tearing the patient to pieces;" and it frequently indicates more disposition to spasm than actual inflammation. Now and then I have heard a cough, which has been regularly followed by a shriek; so as to be absolutely alarming. At the end of every set of expirations, I lately heard one deep inspiration, not attended by a hoop, (as the hooping-cough), but by a shriek; as though the individual were about to have a dagger plunged into her.

With regard to the *heart,* you obtain great information by examining the chest itself. Not only by the touch do you ascertain the force of the heart; but by listening you hear various alterations in its sound. Here again it is very necessary not to attend to any one symptom, or to the occurrence of any one sound; but to attend to the whole set of symptoms. Instead of the usual double sound which you hear in a healthy person, when the heart is affected in a certain way you hear a sound as if a pair of bellows were blowing; sometimes as if

a file were in action; and sometimes as if a substance were being rasped. If you attend to these only, you may be led into error; but you frequently, at the same time, observe great difficulty of breathing on the slightest motion; you observe a swelling of the legs and a deficiency of urine; and you cannot but believe that there is organic disease. In other cases you only hear the sound, and then you would not be justified in saying there was organic disease, unless you listened time after time, and always found the same occurrence. In observing these sounds of the heart, the greatest care is necessary not to form a judgment at your first visit. You may, by attending to the general symptoms, also see a sufficient proof of organic disease; but frequently there are no other circumstances present. The auricular sounds may arise from temporary causes; and you will not hear them two successive days. This shows that these symptoms, like those of the pulse, and almost every other, are never to be taken alone; but only in conjunction with other symptoms; and only when they have been dwelt upon carefully and repeatedly.

With respect to the *abdomen*,—to descend still farther,—the chief symptoms in that region are to be observed by the sight and the touch. The hearing gives you no great information respecting the abdomen, except in the circumstance of striking it, if it be enlarged. If you strike it, especially with the intervention of some little substance, (either the finger or a piece of ivory), you learn whether the tumour arises from liquids or solids, by its emitting a dead sound, as if you struck the thigh; whereas, if it arise from mere air, you find it sound hollow, like a drum. By going over the abdomen carefully, you may ascertain whether there is enlargement of any organ; and you may ascertain the shape of an enlarged liver with the greatest accuracy;—the dulness occurring where you strike over the enlarged organ, and the hollow sound where the abdomen is in its natural state. This is the only point in which the ear is of much assistance. The ear is of the greatest use in diseases of the chest; but in the abdomen you must more particularly have recourse to sight and touch.

Frequently, if you expose a patient in the case of abdominal disease, you may discover an alteration of figure which the hand cannot at once detect. Nothing can be more absurd than for a practitioner to prescribe, at once, for a patient who comes to his house, for disease of the chest or of the abdomen. It is very well to prescribe in that way for diseases of the skin, the head, and other affections; but with respect to diseases of the chest and the abdomen, if, in many cases, you do not listen, or have the patients more or less undressed, it is impossible to form a correct opinion. You may form a good guess, and you may be right; but you will not be able to form such an opinion, as a philosophic mind would always wish.

With regard to the abdomen, by the sight you may discover enlargement, either local or general; but it is certainly by the touch that you acquire the greatest information. You may feel an enlargement of various parts; you may feel the induration of dif-

ferent viscera; and, if there be fluid, you may ascertain its existence, by the occurrence of fluctuation. But one great use of applying the hand to the abdomen, is to ascertain the existence of inflammation. Inflammations of the abdomen are in general easily detected (owing to the circumstance of the abdomen having no bony coats) by the hand pressing upon it; and it is always necessary, in acute diseases, carefully to examine the abdomen by means of the hand. In fever, and particularly in various affections of the alimentary canal, if you do not go over the abdomen carefully with the hand, you may allow inflammation to escape you; which, if neglected, may prove dangerous. In fever, at any rate, it is right every day or two to feel the abdomen carefully;—beginning at the epigastrium, which is the part most frequently affected, and going more or less all over it; but in every case where the abdomen is affected, you find it of the greatest importance to make these minute observations. It is nonsense to say that a physician is to use his pen, and a surgeon his hand. Every physician must be more or less a surgeon, and every surgeon must be more or less a physician. It is as impossible for a physician to do without the use of his hand, in the case of the abdomen, as it is for a surgeon in the case of fractures; and it is not creditable to any physician to pride himself upon not making these "*mechanical* examinations,"—as I believe they are contemptuously called.

With respect to the *excretions* of the body, the sight and the smell give us the chief information. It is by the sight that we judge, chiefly, of the character both of the fæces and the urine; the smell, however, gives certain information in these particulars; as it also does with regard to the excretion of sweat. The sweat, in many diseases, is exceedingly sour; and in others it has peculiar smells, of which I shall speak hereafter. However, we sometimes are more minute in our observations respecting the urine. At any rate, it is necessary not to depend upon the sight and the smell merely; but to employ chemical means for ascertaining its quality. It is frequently requisite to ascertain whether the urine is acid, or neutral, or alkaline; it is right frequently to see whether it contains albumen or not; and in other cases it is necessary to ascertain whether it contains sugar. The most minute observations are sometimes necessary; and, of course, it is only with respect to the excretions that chemical minuteness is at all of service.

As to one sense,—that of taste,—I believe it can only be employed with regard to excretions; and, I presume, with but one of them,—the urine. Some go so far, in professional enthusiasm, as to wish us to taste every thing; but it is not usual except in the case of the urine; and then, for the most part, it is better to get the patient to taste for himself. However, this is not *absolutely* necessary with regard to the urine; because, by evaporation, and by weighing the urine, you can easily ascertain whether it contains sugar or not. I never yet in my life tasted it; but I have no objection, in diabetes, to taste the saccharine extract, for that is not urine.

Having gone through the chief of the organs of the body, I may say that the *whole surface* together gives the same information as the head; but in a very inferior degree. We gain certain information; but it is undoubtedly far less than we gain from simply inspecting the face. From examining the whole body we learn whether there is a degree of fulness or emaciation. By observing its plumpness, we can tell whether the patient is in condition or not. We observe likewise the dryness or moisture of the skin, and the firmness of the flesh. We observe whether or not it is swollen by dropsy. It is to the surface of the body that we employ the sense of smell, with regard to the excretion of sweat. On the surface of the body we can ascertain the increased temperature of the patient; and for more minute observation a thermometer is employed. It is generally put into the *hand*,—one of the two principal parts; or put under the tongue,—a portion of the *head*. Every part of the surface of the body has its own affections; and it is there that not only the chief symptoms of cutaneous diseases,—the symptoms of all its own affections, are to be found; but there we often observe affections of parts beneath. In inflammation, for example, of the dura mater, from an injury, the surface immediately above frequently becomes œdematous. We learn the state, not only of the skin itself locally, but of parts beneath it, by looking at the skin immediately superjacent.

These are the chief observations which I have thought it necessary to make, in a general way, on the third branch of general pathology; called *semeiology*, or *symptomatology*. The fourth division of general pathology is *therapeia;* or the general treatment and prevention of diseases.

Now in regard to most diseases, nature has a tendency to get rid of them. It is ordained by Providence, to a great extent, that the injurious causes to which we are exposed should have but a temporary effect. Either the body has the power of resistance; or the causes exist temporarily, from being applied but temporarily to the body, or from being able to exert no more than a temporary influence. In this way it is that, generally speaking, although there are many exceptions, there is a tendency to shake off disease. This power of the body to shake off its morbid state, is called by writers the *vis medicatrix naturæ*, or *autocrateia*. For example, if any thing too acrid is taken into the mouth, a great flow of mucus and saliva is the consequence; which has a tendency to dilute the acrid matter and wash it away. So with respect to acrid matters taken into the stomach;—the stomach has a tendency to reject them; or if they be passed through the stomach into the intestines, the intestines are excited to action, and they are got rid of. This is the general tendency of the frame.

Again, many causes of disease are only temporary. A person is exposed to a great cause of disease;—the cause ceases; and of course, in many instances, the effect ceases likewise. It is not a necessary consequence, however, that the effect should cease because the cause is removed; but it very frequently happens thus. Again, there are

other causes which cannot produce an influence upon the body, however long they are applied, for more than a certain period. If you take the poison of small-pox, it produces a disease of only a certain duration. The patient may die, but if not, the disease can only last for a certain time; and when it has once occurred, the body, in the greater number of cases, becomes insusceptible of it again. These are the various means which nature has provided for getting rid of disease;—for getting rid of noxious causes before they produce actual disease, and for getting rid of diseases themselves.

Some have so great a confidence in nature, that they leave every disease to itself; and that sort of treatment is called *the medicine of expectation,—medecine expectante.* Such treatment does well in many cases;—it is the best in many cases, both medical and surgical; but it is totally inapplicable to a large number. No one, with a violent inflammation of the lungs, would consent to sit down quietly, in the hope that he would grow better day by day, when he knows that by the lance he may obtain immediate ease, and get rid of the complaint. When a person has taken poison into his stomach, of course he would be mad to wait for nature to effect a cure. He would send for the physician's medicine, or for the surgeon's stomach-pump.

The treatment of the diseases of the human body, is either preventive or curative. We either attempt to prevent disease from occurring, or we attempt to remove it; and when we cannot remove it, we attempt to palliate it. The treatment of the human body, in the way of preventing its becoming the subject of disease, is called *prophylactic;* that which attempts to cure disease, is called *curative;* and when we cannot attempt to cure a disease, still we may do a great deal in the way of palliation;—so that medicine is prophylactic, curative, and palliative. It is a great point very often to enable a person to live, (while he *must* live), incomfort and happiness; and if he must die, it is a great point to enable him to die easily. In many cases we have to adopt both curative and palliative treatment together;—that is to say, we aim at curing the disease; but we adopt palliative measures all the time, for the purpose of lessening any one symptom, or particular symptoms, which it is a desirable object to get rid of, or lessen, before the cure of the disease enables us to do so. For example, in the case of inflammation of the lungs, although we may attempt to cure the disease by bleeding, it is sometimes of the greatest importance to put an early stop to a violent cough by a narcotic.

We can hardly be said to treat disease, when no disease exists; but we must allow an extended use of terms. Whether our means, then, are to *prevent* diseases,—prophylactic; or whether they are to *cure* them,—curative; or whether they are to *palliate* them,—palliative; they may be of two kinds;—*rational* and *empirical.* In the treatment of many diseases, as well as in their prevention, we act *rationally;*—we proceed upon general principles, and the whole treatment is in the highest degree philosophical. We make an accurate diagnosis, in the first instance; we then see what is the wrong

state of the system, and we employ such means as are evidently calculated to remove that state. But in certain diseases, and in certain varieties of disease, we are obliged to act *empirically*;—to act in a certain way, without knowing why we are likely to be successful.

Now this empirical mode of practice is of two kinds. Sometimes we have a specific remedy for a disease, without knowing why; and, in other cases, it is impossible to know the exact variety and character of the disease; and we fire a shot at random that can do no harm, but which may do good. The treatment of inflammation is in the highest degree rational; the treatment of various spasms is the same; and the treatment of continued fever, too, I must think altogether rational. The treatment, however, of ague, of itch, and of syphilis, is empirical; for it is impossible to know why a few grains of sulphate of quinine cure ague; why a few grains of sulphur will cure the itch; and why syphilis will cease sooner if you exhibit mercury, than if you do not. No one would *à priori* imagine, that any of these remedies could have such a peculiar property. There is nothing in the nature of the disease, or in the nature of the remedy, that would lead us to any such conclusions. We are also frequently obliged to be empirical, where we cannot ascertain the proximate cause of a disease. For instance, epilepsy arises, in cases innumerable, from an unknown cause situated in the head, or in distant parts. If we can ascertain that it arises from irritation, our treatment is rational;—we remove the cause. If we can ascertain that it arises from an inflammatory state of the system, our treatment is rational;—we remove the cause. But sometimes we cannot conceive that it arises from either of these sources; and then we use certain remedies that are known occasionally to do good; not that they are a specific against epilepsy,—as bark is against ague, or sulphur against itch;—but because they continually do good in the disease. They are not specifics; for they will often not cure one case out of many; and in many cases they are totally inapplicable; but still they frequently do cure the affection. I allude to copper, zinc, nitrate of silver, &c.

The mode of treatment which is pointed out from the circumstances of the case, is called the *indication*; and things which the nature of the case forbid us to do, are called *contra-indications*. To discover the indications which are necessary in the treatment of a disease, we must make a careful diagnosis of the nature of the case; then we must make an equally careful diagnosis as to the variety of the particular disease; and then we ascertain the stage of the affection, the exact strength of the patient, and the incidental circumstances. For example, we ascertain whether the place in which he lives, at all accounts for his disease; or whether the season of the year is such as is likely to have affected him. We must likewise observe whether there is any peculiar "constitution" of the period. Sydenham used to mention the character of epidemics as "the constitution of the year." Continued fever has sometimes been attended by so much tendency to debility, that evacuations were in the highest degree improper; and the patients did much better when they were allowed to take mere simple food, with scarcely any other treatment. This

has been the case during several months lately.* If the patient was left alone, or treated with what in truth was no treatment at all, he has in most cases done well. If the least evacuation was attempted, the disposition of the disease was to great prostration of strength and rapid sinking. It is necessary, therefore, to know the constitution of the period; and, but for this, I certainly should have destroyed many patients by treating them as I had been accustomed to do. However, I was warned by the experience of others, and by careful observation of what was going on.

It is necessary also to know what are the contra-indications;—whether there is any peculiarity in the patient. Some patients will not bear a remedy which is very appropriate to a disease. The disease may appear evidently to point out the necessity of a certain mode of treatment; but a peculiarity in the individual may render it exceedingly improper. This peculiarity sometimes relates not only to particular medicines, but to particular articles of food; and sometimes there may be some other disease present, which forbids the employment of a particular remedy. For example, if a person have a hernia which cannot be well kept up, and you wish to give an emetic, you would try to do without it, lest you should force the intestines down too violently. You see, therefore, that you are not to be satisfied when you have given a name to a disease. It is a great point to make a good general diagnosis; but that will not do alone. You must make a more accurate diagnosis still; you must ascertain its minute variety, individual peculiarities, and all the other circumstances that I have just now mentioned.

In regard to the things indicated, they are divided generally into two classes,—*regimen* and *pharmaceutical* means;—the former consisting of injunctions with regard to the temperature of the place,—to food, exercise, rest, and every thing of that description; and the latter respecting drugs. In prescribing medicines, it is necessary to recollect that, however excellent they may be, they are frequently rendered abortive by our want of attention to something else. There can be no doubt of the use of a large number of remedies,—both drugs of the Pharmacopœia, and other remedial means; but I have seen them fail, not through any fault in themselves, but through something else that was not attended to when they were employed. For example,—if mercury be given to arrest a violent acute inflammation, you cannot expect it to have that effect, if you neglect to bleed the patient; and even though, in addition to giving mercury, you do bleed, you cannot expect to succeed unless you are particular with regard to diet. So, in diseases of the skin, there are many remedies which have a particular operation which we cannot explain. They are not exactly specifics; but they do great good. Yet the skin, in the midst of these diseases, may be in an inflammatory state, and if you do not bleed and enjoin low diet you cannot remove the affection. As no one symptom can be depended upon, so it is with remedies; and when you prescribe a remedy for a patient, you must take into consideration all the other points on which it is necessary to give directions.

* October, 1831.

Notwithstanding, however, the most scrupulous attention to all the circumstances I have just enumerated, you will often be disappointed in the cure of a disease; but are not to be dismayed on that account. Our profession is capable of effecting the greatest good, chiefly in the way of preventing disease. By improvements with respect to cleanliness, with respect to air, with respect to food, and every thing else of that description, diseases which formerly prevailed to a great extent are now scarcely known; and we can do absolute good, to a large amount, in curing disease when it has occurred. A great many diseases are inflammatory; and over inflammation, by means of bleeding and other remedies, we have the greatest power. When we cannot eradicate a disease, still it is of great importance, and it is also a great blessing, to be able to mitigate pain; and it is to be remembered, that although we fail in the cure of many affections, yet, if we make the attempt, by degrees more knowledge will be attained; and those who follow us, will be able to do what we cannot.

I have now made the chief prefatory remarks which I deemed necessary, before entering upon the consideration of particular diseases,—upon *special pathology*. I have confined myself to an exceedingly superficial view of the subject of *general pathology;* and to the explanation of a few of those terms, which I shall most frequently have occasion to employ.

More minute remarks I shall reserve for various parts of the course. For example, when I come to speak of the causes of inflammation, I shall particularly dwell upon the *modus operandi* of various changes and degrees of temperature in producing disease; and when I come to speak of diseases supposed to be contagious, I shall enter upon the subject of contagion. I think it much better to treat these matters in this way, than to treat them in the abstract before entering upon particular diseases; for by this means they will not only be better understood, but we shall be relieved from the tediousness of dwelling long, at a time, upon general subjects.

Now in the first instance I mentioned that one part of general nosology, or one part of general pathology,—one branch of that part of pathology which is called *nosology*, is the *arrangement* of diseases. One branch, if I may so speak, of general nosology, is *methodical nosology*. You will frequently hear the arrangement of diseases spoken of simply as *nosology;* but that is incorrect. The arrangement of diseases is not simply nosology, but *methodical* nosology;—*nosologia methodica*.

It was long before an attempt was made to arrange diseases. I believe Felix Platerus was the first who struck out the idea of arranging diseases methodically; he was followed by Baglivi, an Italian physician, and Sydenham. However, it was a French physician who first actually arranged them systematically;—Sauvages, who published his work in 1762. It was in that year that the first methodical nosology was presented to the world. After him came the celebrated Linnæus, who arranged every object in nature. He published his nosology in Sweden, in 1763. Another physician, Vogel, published one in 1764. No sooner was the thought put in practice,

than every body went to work. The arrangement of Cullen was published in 1769; another was published by Dr. Macbride, and one by Sogar, at Vienna, in 1771,—so short a time elapsed; then one by an author named Vitenus; one by Dr. Thomas Young, the celebrated English philosopher; and one still more recently by Dr. Good. There have been others, but these are the chief.

Now, however useful it may be to arrange diseases slightly, for the purpose of memory, and for the purpose of general views, I think it must be confessed, that all these various *methodical nosologies* only perplex and encumber the mind. I studied the arrangement of Dr. Cullen formerly very minutely, and had great part of him at my fingers' ends; but I confess that my knowledge of it now is but of a very superficial kind, and that it was never of any use to me. The arrangements of Drs. Young and Good appear to me just as useless; and I would not, if I were to advise you honestly,—and I hope I always shall do so,—I would not advise you to plague yourselves about nosological arrangements. My own experience tells me that it is a much greaterplague to recollect the arrangement, and all the hard words, than to recollect the things for which the arrangement is made. I never found it of the slightest use; any more than the barbarous jargon of the *Propria quæ maribus*, and *Quæ genus*, of the Latin grammar.

On the inconsistencies and defects of these various arrangements, I will not dwell; for if you turn to any methodical nosology, you will find them in sufficient abundance. You find exceptions made to the plan, which the author has laid down in his arrangement; and you find the most gross absurdities. If you turn, for example, to Cullen's arrangement (which is one of the best) you will find that a large number of diseases which are daily occurring, have no place in his nosology. Such was his arrangement, that there was not only no place for many most important diseases, but he arranges itch and fracture together. In speaking thus of Dr. Cullen, allow me to say, that although I think little of his arrangement, there can be no doubt that it was far better than that of any of his predecessors; and I must be allowed to pay a tribute of respect to his memory, as one of the most sagacious and best of men, that ever joined themselves to our profession. I should be very sorry to endeavour to captivate your minds, by attempting to lower any one in your estimation. Nothing can be more contemptible; and as regards Dr. Cullen, nothing could be more unjust. You find in his work the utmost candour, and the soundest information; and although he indulged in hypotheses to which some Scotch physicians have been prone, yet independently of that, his descriptions are elegant and simple, and you will find his definitions admirable. It is to be remembered that his work on the Practice of Medicine, was not considered by him a perfect work; and he modestly called it "First Lines,"—a mere outline; but such as they are you will find them, according to the information of that day, exceedingly useful; and it is on account of the excellency of the original work, that I should perhaps prefer recommending to your study an edition of Cullen, with notes, to the work of any other individual. I think the advantage of

having Cullen's work, with notes, although it should not contain more information, is, that you have the work itself of Dr. Cullen; which was not surpassed in his day, and has not since been surpassed, as far as respects the knowledge of that period. I think you cannot do better than study the edition by Dr. Gregory.* There are many other excellent works;—Dr. Gregory's,† Dr. Mackintosh's,‡ Dr. Good's;§—any one of which is worth possessing, and would form a good basis for study; but I think altogether you will find Cullen's, with notes, the most profitable to you as *students*.

The most natural mode, in my opinion, in which we can attempt to arrange diseases in our mind,—that which serves best for the purposes of recollection (for an arrangement is certainly useful; although I am not an advocate for a *methodical* one, so called) is a two-fold arrangement; first, as to the nature of affections in general,—whether they are inflammatory, structural, functional, mechanical, or parisitical (for whenever we see a case, we immediately consider what is the kind of affection); and then, secondly, as to the part in which the affection occurs. This is the arrangement which I shall follow. I shall first consider general diseases,—such as affect every or most parts of the body;—inflammation, scrofula, and various other organic diseases; and afterwards, having considered all the affections which may attack any part of the body, I shall proceed to consider those affections and all others, whether functional, mechanical, or parasitical, as they attack the body from the head downwards—*a capite ad calcem*. I think we all make two inquiries in considering any case;—the one is the nature of the disease, and the other is the situtaion of it. This is the utmost assistance, I think, that the memory can have from arrangement; and this is the plan which is continually followed by *practical* writers. They write on particular diseases, whatever they may be—inflammation, cancer, &c.; and of the whole diseases of particular organs, and sometimes of particular regions. You have one writer publishing a work especially on diseases of the urinary organs; another entirely on diseases of the nervous system; another, entirely on diseases of the head; another, on diseases of the chest; and this course we naturally fall into. But, independently of that, we must make observations upon the general affections to which all parts of the body are liable. I am quite satisfied that this sort of arrangement,—by which we first consider general affections, which may attack any one part of the body; and then consider the affection as seated in this or that part,—will afford us all the assistance that arrangement can give; and I hope you will never plague yourselves farther with methodical nosology. ‖

* "First Lines of the Practice of Physic;" by William Cullen, M.D.; with Notes, by Dr. W. Cullen, and Dr. J. C. Gregory; 2 vols. 8vo.

† "Elements of the Theory and Practice of Medicine;" by George Gregory, M.D. Fourth Edition, 8vo.

‡ "Elements of Pathology, and the Practice of Physic;" by J. Mackintosh, M.D.

§ "The Study of Medicine," by John Mason Good, M.D.; edited (with numerous additions) by Samuel Cooper, Professor of Surgery in University College.

‖ See Appendix, No. I.

INFLAMMATION.

The first disease of which I will speak, is the most general of all affections. It is one which attacks almost every part of the body,—at least all vascular parts; and which is the most frequent of all diseases;—*Inflammation.*

In the first place, this is the most general of all diseases; it will attack any part of the body that is vascular. In the second place, it is one of the most frequent affections. It is a disease which scarcely any person escapes; it is a disease which is seen every day. It occurs simply by itself; and it is the concomitant of a variety of other diseases. Many diseases are *always* inflammatory, though they are not simple inflammation;—though there is something more than inflammation, yet inflammation is united with them; and many other diseases are *frequently* inflammatory, but not *always.* Besides, inflammation is continually occurring as a means of benefit to the body. It is not only a morbid process; but a process frequently set up by nature for the purpose of restoration, relief, and prevention. It is a disease, too, which proceeds from a vast number of causes;—causes to the action of which we are continually exposed, whether we will or not.

Again, it is one of the most dangerous diseases when it affects certain parts, and any part when it proceeds to a certain extent; and it is always liable to be carried to this dangerous point. However slight an inflammation may be, it is always liable to become aggravated to a dangerous point; and it continually does actually attack the most important organs; and hence we may be justified in saying, that the consideration of inflammation is more important, than that of any other affection of the body.

When it occurs, not as a disease, but for the purpose of restoration,—for the purpose of health, if I may so speak,—the circulation of the part becomes increased; the quantity of blood becomes augmented; and more nourishment is afforded than before. If a part be destroyed, or divided, a degree of inflammation is set up, and fresh matters are deposited, so that the part is more or less renovated. When a bone is fractured, a certain degree of inflammation occurs, for the purpose of pouring forth a fluid, which afterwards becomes solid, and produces union.

In the next place, inflammation is frequently employed by nature, to prevent the escape of matters into parts where violent inflammation would be produced; and is set up by nature, to prevent its own occurrence in another spot. For instance, when an ulcer takes place in the stomach, or in the intestines, if it proceed unchecked, the contents of the stomach or the intestines, are poured forth into the cavity of the peritoneum, and a violent inflammation is set up;—an inflammation, in the greater number of cases, fatal. Nature, however, very frequently sets up a little inflammation outside the organ, exactly at the part corresponding to the ulceration within; by which means it is glued to the surrounding parts. Fibrin is

poured forth; the fibrin becomes vascular; the parts become still more firmly glued; and then the disease of the stomach or the intestines, cannot ulcerate through into the peritoneum. Thus, a slight inflammation is set up in one spot, to prevent an inflammation which would be fatal to the patient. You will see the stomach sometimes attached to the peritoneum, and sometimes to the liver.

Then, again, nature frequently employs inflammation to give an exit to something which is injurious to the body. When a biliary calculus is impacted in the ducts, and is too large to escape, it sometimes happens that these ducts become attached, by inflammation, to the intestines. The inflammation, after it has excited adhesion, proceeds, perhaps, to ulceration; and when the latter occurrence takes place, the calculus escapes through the opening into the intestines. The inflammation, in the first place, is set up to prevent the communication which would afterwards take place into the peritoneum, so that the bile and the calculus shall not escape into it; and when all these parts are firmly glued together, and the danger prevented, then, at the particular spot, inflammation goes on to ulceration. Ulceration takes place into the intestines; and in that way an exit is given to the foreign body.

When a part of the body mortifies, whether through inflammation or not,—when a part has become dead, and useless to the body, and even injurious to it from its presence,—then inflammation is employed for the purpose of separating it. At the boundary of the living part, inflammation is set up; a red line appears at the extremity of the healthy part, where the dead part begins; and that red line is a line of inflammation; which inflammation proceeds to ulceration. A furrow of ulceration takes place; and goes down till the part is ulcerated through, and the dead part falls off,—having been separated by the ulceration of the living disease.

You see, therefore, that inflammation, although a most fatal disease in many cases,—although conjoined with the most frequent and violent diseases,—is sometimes a most salutary process;—is sometimes employed by nature to produce an union of parts; sometimes to prevent the great mischief which would arise from an effusion of fluids into parts where they ought not to go; and sometimes for the purpose of giving exit to foreign bodies, or of separating dead parts from the living.

The general definition of inflammation is, "redness, swelling, heat, and pain;" that is to say, *morbid* heat,—*morbid* redness. Swelling and pain require no definition, but redness is healthy in some parts; and therefore we must understand *morbid* redness;—and with respect to heat, *morbid* temperature. These are the four chief symptoms of inflammation,—those which make the definition in general,—in the words of Celsus,—"*rubor et tumor, cum calore et dolore.*"

These are the general constituents of inflammation; and if they do not all exist in all cases, still usually the greater number are present. Sometimes one is absent, sometimes another; but the *redness*

is never absent. The redness is certainly indispensable to our idea of inflammation; and it will sometimes exist without swelling, without heat, and without pain; without any of these individually being induced,—without any two of them; and now and then the redness will exist alone, without any of the three. Whether the state should then be called inflammation or not, may give rise to a difference of opinion. But frequently you have inflammation without any perceptible swelling. You must conceive the part to be a little increased in size,—because there is more blood than natural; but without a sufficient enlargement to justify you in using the word "*swelling*;" —without much increase of heat, and sometimes certainly without pain; and it is to be remembered that both the increase of temperature and the redness, (by which we understand a *morbid degree* of them), may arise from other circumstances than inflammation; as may also the swelling and pain.

Still, although redness is indispensable to inflammation, it is not every redness that we have a right to call inflammation. A certain degree of it is necessary to the idea of inflammation. How much cannot be specified; but, like sensations in general, it must be experienced to be learned. The requisite intensity will vary in different parts, according to their natural colour. A blush, or momentary rosiness, is not considered an inflammation, and every part is liable to this momentarily in health. As regards the cheeks, a degree of redness there would not be considered inflammation, which we should be fully justified in calling so, if it affected other parts of the body. The most intense redness, if it last only for a moment, we should not call *inflammation*. In the cheeks it must be,—supposing the person has a natural colour,—a very deep red indeed, and more or less permanent,—at least not a transient redness, though intense, to enable us to say that the cheeks are inflamed.

Again, the same degree of redness,—the same intensity of it, would not be considered inflammation if alone, which would be considered so, if there were also pain and morbid sensibility. If we saw in the cheeks a great redness, we should not hesitate to call it inflammation, if we found the part were morbidly sensible; or if the patient complained of its smarting, and being painful independently of pressure. Although the redness might be less intense, and might not continue so long as alone to justify us in calling it inflammation, yet provided it were in a part which is not naturally red, like the cheeks,—not liable like them to occasional flushing and rosiness, a much less degree of it, and a much shorter continuance, might give us the idea of inflammation. You see how many things are to be taken into the account. A knowledge of these things cannot be gained at once; and many circumstances must be called in to aid us in our judgment. When persons are speaking of redness in connexion with inflammation, instead of the mere expression *redness*, we ought to say *morbid*, or, perhaps, *preternatural* redness; because what is morbid redness in one part, is not morbid redness in another; —redness preternatural to the part affected.

Now redness is not only of various degrees of intensity in inflammation, but of various hues;—being sometimes of a bright scarlet, sometimes rather purple, and of all intermediate shades. Besides varieties of hues in redness, the redness may be distinctly circumscribed in patches; or it may be insensibly lost in the natural colour of the surrounding parts, so that we cannot exactly say where it ends.

We will now proceed to the consideration of the other symptoms; and first of *heat*. It is right to say, that for the same reason which makes one adopt the epithet "*preternatural*" or "*morbid*," in regard to redness, we should likewise affix the same epithet to heat; because the body, in this country at least, and in most others, is hotter than the surrounding temperature; and therefore it is always hot. A preternatural heat, if not very great, is not of necessity inflammatory; and if it be very great, and yet last but for a short time, even then it is not inflammatory. A certain intensity, and a certain duration, are necessary to constitute inflammation in the case of heat, as well as in the case of redness. The greatest intensity of heat, if transient, would not be considered inflammation. The burning heat upon the cheeks, the palms of the hands, and the soles of the feet, in hectic, is never considered inflammation, even though it is combined with preternatural redness. The most intense heat, and also the most continued, is not of necessity inflammation, unless it be united with a pretty permanent preternatural redness. The whole body may be of a burning heat for weeks, as hot as an inflamed part; and yet the skin is not said to be inflamed. The example of hectic shows that even a combination of heat with intense redness, is not sufficient to give the idea of inflammation; for in these intense spots in hectic there is no pain, nor are the parts most affected tender on pressure. Besides that, I need not say that morbid temperature only comes on for a few hours in the day; and is a mere concomitant in hectic from another disease. In addition to this there is no swelling in this affection; and therefore we have still greater reason for saying, that it is not at all inflammatory.

With regard to heat, the temperature of the affected part appears much higher to the patient, than it really is; which arises from the parts being in a state of morbid sensibility. In palsy it is not very uncommon, when there is no increase of temperature at all,—no inflammation,—for the patient to feel every thing hot; so that if he sit on anything without his clothes, it strikes hot to him; or if he put his hand on any substance, whatever it may be, it appears as if it were heated. This is a peculiar state of the system, and not inflammation. There is in inflammation a general morbid sensibility of the part; and therefore the degree of heat which actually occurs, produces greater effects than it would in any other part of the body. But although, from the morbid sensibility of the part, the increase of heat appears greater to the patient than it really is, there can be no doubt that in inflammation the temperature is raised. When the notrils are inflamed, or the bronchial membrane, or the throat, the

air that we expire is so heated in passing over the parts, that, as it comes out at the nostrils and lips, it is felt to be burning. If you apply your hand, which is in a state of perfect health, to the inflamed part, you feel that it is hotter than usual; and if you make use of a thermometer, you ascertain the point to a nicety. You continually find the parts inflamed hotter, by many degrees, than other parts of the body. It is not uncommon for them to be at 107°. John Hunter made experiments, to show that the temperature of inflamed parts was but little augmented;—at least not higher, he said, nor even so high, as that of the blood at the heart and in the chest; that if the parts had naturally a lower temperature than the centre of circulation,—as for instance, the hands and the feet,—and they became inflamed, their temperature never rose so high as that of the centre of circulation. The general temperature is said to be 98°; but it varies in different parts. The farther you proceed from the heart, the lower it becomes; because there is less circulation there, and the parts are more exposed to the temperature of the surrounding atmosphere. There is a great mass of substance at the trunk; there is less on the arms; still less at the extremities of the fingers, at the nose, and the ears; and there is more exposure.

Now John Hunter produced inflammation very cruelly in the thorax, in the peritoneum, in the rectum, and in the vagina; and he found the heat but one degree and a half higher than before the inflammation; and he frequently found it exactly the same. He says that the temperature of the vagina, at the utmost increased to 101½°; but he found the temperature of the tunica vaginalis only 92° in health; whereas, when inflammation was produced in it, it rose to 98¾°;—98° being about the natural temperature of the body. It is to be remembered, however, that the scrotum is a part very much exposed to the surrounding air,—a depending part; and is therefore as much exposed to the surrounding atmosphere, as the hands, feet, ears, or nose; and he infers that the heat is never raised above the natural standard at the centre of circulation. If the natural temperature of the tunica vaginalis be 92°, certainly the increase to 98¾° is very considerable. He says that he once found the abdominal fluid to be as high 104°; and he says that if inflammation attack any part with a temperature of 98, the heat may proceed beyond that of a healthy person. Now, however correct these experiments may be, you have only in the case of erysipelas to take a thermometer, lay it upon the inflamed part, and cover it up; and you will then see the temperature, although it be erysipelas of the *leg*, often raised to 104, 105, 106, or 107 degrees.

That the temperature of the body may be increased very considerably, in various circumstances, is shewn by the following facts. Sir Everard Home observed the oviducts of a frog when about to spawn, and when a great local activity of circulation was going on, to be two degrees higher than the temperature of the heart. Now there was no inflammation here; but merely a great activity of circulation approaching to inflammation, such as occurs

in the generative process; and the result was as I have stated. If then a mere natural process, short of inflammation, will raise the heat above that of the centre of circulation, you may well suppose what inflammation will do. Even in vegetables, when a certain process is going on with great activity, a very considerable increase of temperature takes place. When the *arum cordifolium*, and the *arum maculatum*, are about to burst, the temperature, by placing a considerable number around a thermometer, has been such as to raise it very considerably. Twelve were placed around a thermometer; and so high a degree of heat was developed in the physiological process of bursting, that the instrument was raised from a temperature of 70° to that of 143°. Even in fever, by placing the thermometer under the tongue, you find the temperature raised many degrees; and the same occurrence takes place in acute rheumatism. In one case of phlegmasia dolens, on placing the thermometer on the thigh, and covering it with the hand or bed-clothes, I found it rise to the same degree of heat that is frequently observed in fever, and in acute rheumatism;—namely, to 107 degrees. Indeed one gentleman says that, having introduced a thermometer into the vagina, during labour, he has observed the temperature of the uterus to be 120 degrees. During the violence of the spasm in tetanus, the temperature is frequently as high as 107 degrees. There can be no doubt, therefore, that inflammation is frequently attended by a great increase of temperature. I have seen it myself in various inflammations of the surface. This, however, is not peculiar to inflammation; for, as I have stated, it occurs in fever and rheumatism; where the thermometer has not been applied to the rheumatic parts, but put under the tongue, and in various parts of the body; and it has been observed likewise in many affections of the system.

But as an increased heat may exist without any inflammation, so inflammation—that is to say, redness and swelling, of an undoubted inflammatory character, as proved by the terminations—may exist without any preternatural heat. You will sometimes have inflammation, or what I certainly think we are justified in calling so,—that is to say, preternatural redness and swelling, going on to suppuration,—without any increase of heat: and this state of the parts has been called *passive* inflammation. Some object to the term, and say it does not deserve the name of inflammation;—that it is mere congestion of blood. But it will go on to suppuration; and therefore I think we are justified in calling it inflammation, although there is no increase of heat. It is right, however, to tell you that some actually object to calling such a state *inflammation;* and they limit the term "*inflammation*" to an active state, in which there is pain, and all those symptoms which I mentioned. To avoid any quibbling, Andral calls any state in which there is a morbid collection of blood, *hyperemy*,—excessive quantity of blood in a part; when it is actively inflamed, *active hyperemy;* and when a passive state occurs, he terms it *passive hyperemy*. Thus he gets rid of the difficulty altogether, by no longer using the word inflammation; but

by using a word signifying congestion of blood, and applying one epithet or another to it.

If we consider the third of the symptoms,—*swelling*, we shall find that it also may exist without any inflammation. Swelling, although frequently a symptom of inflammation,—more frequently than not,—may of course exist (just like an increase of temperature, or an increase of redness) without inflammation. Any thing, almost, will produce a swelling. The mere displacement of a part, the dislocation of a bone, hernia, the mere effusion of hæmorrhage, or a mere collection of water or any morbid growths, whatever their character, or the presence of air within the body, will all produce swelling. Swelling, then, may be produced by many causes besides inflammation. For a swelling to be considered inflammatory, it must be united with pain or a preternatural redness; and even then it may be chiefly dependent on other causes. For instance, in dislocation you may have inflammation of the ligaments and integuments, producing pain; but the swelling arises chiefly from the displaced bone. Again, it is to be remembered that inflammation may sometimes exist without swelling; as is occasionally noticed in ophthalmia. In ophthalmia, the turgescence often gives rise to no perceptible swelling. Sometimes there is a little swelling; but frequently this affection, and many superficial inflammations of the skin, are not attended by any swelling. Sometimes you will actually see a part inflamed, in which there is scarcely any pain, and no increase of temperature, but excessive redness and excessive swelling. The congestion is extreme; and gangrene, in such a case, is very likely to take place.

You see, therefore, that not only the symptoms will arise from various other causes than inflammation; but that they are frequently out of proportion, when they do occur, to each other. Sometimes a little inflammation is attended by very violent pain; and sometimes a little inflammation,—a little increase of heat, is attended by the most violent swelling. There is no necessary proportion between any of these symptoms.

Then if you take the last of the marks of inflammation,—*pain*, we shall find that it will arise from many other causes beside inflammation. Pain will arise from a mere spasm. Nothing is more painful, for example, than cramp in the legs. Pain arises frequently from scirrhus, or cancer: some call this "chronic inflammation;" but certainly there is something more than that. Pain, too, is frequently neuralgic; being dependent on a violent affection of the nerves, in which no inflammation can be detected during life, and no effect of inflammation discovered after death. Pain continually arises from inflammation, but it continually arises also from the other sources just pointed out; and sometimes it is absent in inflammation. You will see a part violently red, and violently swollen, without any pain at all; and sometimes nothing is worse than this; for the part may fall into gangrene.

Just as there may be varieties of heat, and various hues of redness, so there may be varieties of pain. The pain is sometimes ten-

sive. If the part be one that will not stretch, then the pain is of a tense character; and the part feels as if it would burst. If it be inflammation inclined to suppurate, the pain is of a throbbing character. If it be inflammation of the skin, the pain is frequently of a smarting or of a tingling character. If it be inflammation of a mucous membrane, you frequently have it characterized by a burning and pricking pain. If it be inflammation of a serous membrane, a stabbing sensation will often be experienced, as though a knife were being plunged into the part. There are, therefore, great varieties of pain; just as there are various hues of redness.

The pain of inflammation is generally increased by pressure, —at least by *sudden* pressure; whereas pain arising from spasm is generally relieved by pressure. You have this very strikingly shown in colic and in enteritis. In the latter, the pain, of course, arises from inflammation; and if you press the abdomen, even with the point of one finger, the patient experiences exquisite pain; whereas, in the former, which is a mere spasm of the intestines, the more you press the more is the patient relieved; so that I have found a patient able to bear the pressure of both hands, with my feet almost raised from the ground, standing on tiptoe; and the more I pressed the greater was the relief. But the two may be connected; and then you have a certain portion of relief, and a certain portion of aggravation.

However, it is necessary to say, that although the pain of inflammation is increased by pressure, it is rather by this being *sudden*, than when it is gradually increased; for frequently, if you press an inflamed part very slightly, and gradually augment the amount, very considerable pressure can be borne, provided you press the *whole* part. If you press only one spot, even slowly, you are sure to give pain; but if you can embrace the whole part, and press it all gradually, so as to empty it of its blood, you will frequently produce ease. This is shown every day in the case of inflammation at the bottom of the foot. If you have a blister upon the sole of the foot, or at the ball of the great toe, and you rest gradually upon the part, the pain becomes mitigated, till at last it seems to be almost entirely removed: but the moment you take off the pressure and raise the foot from the ground, you feel the part begin to throb, with violent pain. It appears, therefore, that if an inflamed part be pressed suddenly, it is sure to have its pain increased. If it be pressed even gradually, but only partially, you generally produce the same effect; because, if you press only one part, the other becomes more gorged with blood; but if you can press the whole together, so as gradually to empty all the vessels, or diminish their contents, then pressure can be borne; and, more than that, it frequently gives relief.

Hence pressure has been recommended as a means of cure, by certain writers, in some inflammatory diseases. Pressure has been recommended for the cure of gout and rheumatism, by Dr. Balfour, of Edinburgh; and a French surgeon (Velpeau) has recommended it in erysipelas. But it frequently happens that, although relief may

be given in some cases, considerable aggravation is excited in others. It is necessary that the part should be all compressed,—that the pressure should be equable; for any deviation in this respect, so that a part of the vessels were allowed to become the more distended, would increase the mischief. Very frequently, too, inflammation does not depend altogether upon local causes. There is a tendency to it in the constitution; and although you impede the circulation of the part, you do not stop the impetus of blood running to it. The large arteries around, are found to throb violently against the part compressed; and pressure frequently cannot be borne at all. On all these accounts, it is exceedingly difficult to cure inflammation by pressure. As a general rule, however, we may say that the pain of spasm is diminished by pressure, and the pain of inflammation increased by it; and this criterion is continually resorted to, as a means of diagnosis;—as a means of distinguishing whether pain is inflammatory or spasmodic.

Pain is, generally speaking, greater in proportion to the tension of the part attacked. The less a part will yield, the greater generally is the pain. Hence much inflammation of the theca of a tendon, is generally attended with great agony; and, from a similar cause, when matter is formed, if it cannot escape, (owing to the part not yielding at all), the pain is most agonizing; whereas, by relieving the tension in making an incision, so as to allow the escape of even the smallest quantity of matter, and the yielding of the part, the pain instantly disappears; and more than that, the great irritation of the system, which, perhaps, amounted to a violent delirium, also vanishes. All these things frequently cease, as if it were by magic, when an incision is made. Hence, too, the great use of incisions in certain inflammations of the skin and the cellular membrane. In what is called *phlegmonous erysipelas*, the cellular membrane becomes excessively gorged with fluids. The skin is distended, and the greatest agony is felt; but a few incisions will put a stop to all this. I presume it is for the same reason, that, in inflammation of a serous membrane, you have far more violent pain than in inflammation of a mucous membrane. These serous membranes in general are tense, and give the most violent pain when they are inflamed; whereas the mucous membranes are all of a yielding character; and inflammation of them is consequently never attended by a violent stabbing pain. You know that serous membranes are generally spread out pretty tightly;—at least a considerable portion of them; and therefore you generally have a violent stabbing pain, when they are inflamed. But sometimes this is not the case; and then the less degree of pain may arise from the affection being seated in a portion that will yield.

But pain, according to its situation in various parts, may be sharp, dull, smarting, or burning. Sometimes it is a mere soreness;—no pain is felt unless the part is irritated mechanically, or some particular stimuli are applied. Parts which have little or no sensibility in health, acquire sensibility under inflammation; and frequently very *intense* sensibility. Many parts which may be cut in health,

without the individual, whether man or brute, experiencing any sensation, cannot, when inflamed, bear the slightest motion or the slightest pressure. If, therefore, parts which show no sensibility in health, become very sensible in inflammation, you may suppose that parts which are naturally sensible in health, may become very painful when in a state of inflammation. However, the degree of pain will not be commensurate with the degree of original sensibility; because it depends so much likewise upon the tension, or upon the yielding character of the part. If it so happen that a part which has no sensibility, or but little, but which is nevertheless an unyielding part, becomes inflamed, the pain will be dreadful;—more dreadful than it would be in a part which naturally has sensibility, and yet is of a yielding character.

Inflammation is generally known by pain, increased on pressure; by feverishness; and by a disturbance of the function of the part. When we see a person labouring under disordered function, under feverishness,—pyrexia,—and under pain, which pain is increased by pressure, although we cannot see the part, we have no doubt that it is inflamed,—that the proximate cause of these symptoms is inflammation. Sometimes there is no pain experienced, but simply disturbance of function and feverishness; and when that is the case, we are not sure that there is an internal inflammation. When a part can be seen, the symptoms which I have already mentioned, few or more of them, will be sufficient to characterize the complaint; but we are certain also of the existence of inflammation, even when the part is invisible,—when we cannot ascertain whether it is red, hot, or swollen, or not; but where there is pain increased on pressure, the function of the part disturbed, and the patient labouring under what is called "feverishness," or "pyrexia."

These are the four symptoms of inflammation during life; but they may have existed at that period, and yet none of them remain after death. The pain and the heat, of course, must disappear; but the redness and swelling you might expect to remain. When, however, we have seen a part inflamed during life, or such symptoms have been present as to leave no doubt of the existence of inflammation, in both cases you may find, on examination after death, no marks of inflammation at all. Yet the absence of these marks does not, in any way, invalidate the opinion which you formed during life; for it will sometimes happen that, after death, every mark of inflammation will disappear. You may sometimes, in inflammation of the surface of the body, or of the eyes, (visible enough during life, and of which the patient died), find both parts pale after death. The skin, perhaps, will be slightly swelled; but the swelling will be greatly diminished, and the redness entirely gone. This is a certain fact respecting inflammation in general; because it is observed with regard to external inflammation. After apoplexy you will frequently find nothing. Although, during life, the head appears to be bursting from an accumulation of blood; and the patient has died of the complaint; yet you will frequently find, after death, no morbid appear-

ances. All the vessels, when the temperature of the body cools, recover themselves; or the blood, in some way or other, goes to other parts; but this occurrence does not always take place. You will sometimes find that where there was no doubt, from the symptoms, that internal inflammation existed, the marks of the complaint disappear after death. Sometimes they do; but it is by no means general.

On the other hand, you must recollect that it is not every preternatural redness you discover after death, that is inflammatory. You may find an intense redness of the internal parts, in the bodies of patients, whom during life you did not suspect to be labouring under inflammation; and you are not on that account *alone* to suppose that they did; for just as the redness of inflammation will frequently disappear after death, (either in a great degree or altogether), so after death, without any previous inflammation, you may have morbid redness of the parts. If the patient have died with great difficulty of breathing, so that a large accumulation of blood has taken place in the lungs, you may find the liver gorged with blood; and you may find the mucous membrane of the stomach and intestines exceedingly red;—not from inflammation; but simply because the blood was obstructed in the lungs, or in the heart, and consequently congestion took place. In a case of great debility, a continuance of the patient in one posture during the latter period of his existence, will cause such an accumulation of blood as, after death, to give rise to great redness; and these appearances are always greater, in proportion to the number of capillary vessels in the part to which the blood inclines by its gravitation. The blood will not merely accumulate in the vessels in this way; but it will transude from them, so as to dye the surrounding parts perfectly red, and prevent your distinguishing the appearance from inflammation. This is particularly the case in hot climates and in hot weather. Dr. Davy, the brother of Sir Humphry, says (in a paper published in the tenth volume of the "Medico-Chirurgical Transactions"), that he has found it, in hot countries, often impossible to distinguish the redness of inflammation, from the redness of transudation, or from the redness from a piece of membrane being merely steeped in blood; and from all his observations and experiments he draws the conclusion, that if, in a hot climate, a body be not opened within twenty-four hours after death, the surfaces become red; that the serum of the cavities likewise becomes bloody; and that the viscera becomes livid; so that no opinion can be formed as to what was the state of the parts during life. The reason is this;—the hotter the temperature, (within certain limits), the sooner does decomposition take place; and the more a part is decomposed, of course the more easily does transudation occur. The solids become more soft,—more spongy; and blood which comes in contact with them, easily pervades them,—oozes through them; and dyes them, and any of the liquids which the parts may happen to contain.

You notice, in dead bodies which have lain any time upon their

back, especially in hot weather, that the posterior parts all become livid, and filled with blood; while the anterior parts are pale. The body being usually placed on the back, if you open it and examine the lungs, you find their posterior part heavy,—filled with blood,—livid;—in fact exhibiting exactly the same appearance, as the anterior part does in violent bronchitis; and every one accustomed to make post-mortem examinations, allows for this occurrence. He never thinks of considering it a morbid appearance; it is simply the effect of the blood gravitating to the lowest parts. You will observe also, when bodies are at all decomposed, that read streaks appear along the surface, in the direction of the various veins. The blood accumulates in all the veins after death; and as the substance of the coats becomes more and more decomposed, it allows the blood contained within the veins to transude; and in that way the coats themselves become thoroughly dyed with blood, and the cellular membrane around the vessels becomes dyed likewise; you may trace the superficial veins in the dead body from this appearance. This is nothing more than a transudation of the blood, through a degree of decomposition having occurred.

The observations made by Dr. Davy, many years ago,—respecting the importance of examining bodies early in hot-weather, and shewing the importance of knowing that such appearances as are induced by inflammation, may take place merely from decomposition,—have been all lately confirmed by Andral; who, to make his observations the most striking, has examined the same part of the body at different periods. Early after death, he has found an organ pale; but if it were afterwards so placed as to favour the gravitation of the blood to a certain portion of it, that part of the organ, when subsequently examined in a few days,—decomposition having proceeded,—had become intensely red.

The blood will not only accumulate in the solids in this manner, and not only exude in sufficient quantity to dye any liquids that may be within the cavities, but it will itself exude to such an extent, that a canal may be found containing a large amount of pure blood. By causing a considerable portion of intestine to be dependent, the blood has gravitated to such an extent, as to pass through the vessel into the cavity, and lie there in the form of a hemorrhage. Two French writers (Rigot and Trousseau) have made numerous experiments upon this subject; and they say that they have frequently made the blood ooze from the inner surface of the intestines, by merely giving a portion of them this dependent position.

You must therefore be aware, that the mere appearance of redness, is not sufficient to justify you in saying that a part has been inflamed. A part may be red because it was inflamed during life; but you must always take into consideration, whether the body has lain long, so as to be partly decomposed, and to allow the diffusion of blood into the substance of the parts. Indeed, a degree of putrefaction not merely allows this infiltration of blood into the parts, but

the parts themselves become dissolved into a liquid substance;—they liquify. As the body putrifies, it becomes soft; and a large quantity of liquid is produced, in addition to the pure blood; and assists materially in dyeing the different parts. You have therefore to take into consideration, what is the period at which you examine the body, and also what is the position of the part;—whether it is such as is likely to have favoured the gravitation of its own blood, and that of other parts, in any quantity. You have also to take into consideration another circumstance, independent of time and of position;—that is, whether any mechanical obstruction existed during life. You may examine a body immediately after death, so that putrefaction has not occurred, and placed upon its back with the stomach high, so that the blood could not have gravitated there; and yet you may see such redness of that organ, that you would consider it inflammatory, if you did not also know, or ascertain, that there had been a mechanical obstruction. If there have been a mechanical obstruction to the return of the blood through the lungs and heart, then that will explain redness of the stomach, without your being under the necessity of referring it to inflammation. There are, therefore, three circumstances to be taken into account;—the period at which you examine the body, the situation of the part as to gravitation, and the previous existence or non-existence of mechanical obstruction. A simple inspection of the parts which are red (provided there is nothing but redness) will give you no information whatever. You must ascertain whether there were any symptoms of inflammation during life; and must observe the three circumstances to which I have just alluded.

There is, however, another circumstance, which will frequently enable you to say that inflammation actually existed; and that is the presence of the products of inflammation. If you find a part intensely red, and you see a layer of lymph effused, or a large quantity of serum,—perhaps *turbid* serum,—perhaps, too, with flakes,—then you may be almost sure that the redness is inflammatory. The redness, it is true, may be increased by decomposition or by mechanical circumstances; but if you see the products of inflammation, then you may fairly conclude that the redness (either altogether, or the greater part of it) is inflammatory. These observations you will find of use, with respect to inflammation in the inner surface of the heart. The lining membrane of the cavity of the heart, especially at the valves, is sometimes very red, without any inflammation. Some persons will say there was inflammation during life; others will say there was not. Of course the point generally may be cleared up by minute observation;—by feeling whether or not the heart is soft, so as to allow the membrane to be stained by transuded blood; but if you see an effusion of lymph upon the membrane, then you may be sure that the redness is of an inflammatory character;—that it is the result of inflammation, either in part or altogether.

These are the observations which I have thought it necessary to

make, respecting the marks of inflammation during life and after death.

Inflammation is usually divided into two kinds;—the one *common*, the other *specific*. "Common" inflammation is that which we see every day, where a local injury takes place, or when a part has been exposed to the vicissitudes of temperature; but the epithet "specific" is given to inflammation, when it runs a peculiar course; or when it arises from a peculiar cause, neither mechanical, nor simply irritative. When inflammation runs a peculiar course, it is then by many called "specific;" but more frequently it receives that appellation, only when it arises from a peculiar cause. For example, inflammation of the urethra, from the forcible introduction of a bougie, or of a catheter, would be *common* inflammation; but the inflammation of gonorrhœa, arising from a peculiar cause, is termed *specific* inflammation. In specific inflammation, you have all the symptoms which occur in common inflammation; but with some peculiarity is superadded. Common inflammation is the groundwork; but in specific inflammation, some other circumstance is superadded.

I will first speak of the course of common inflammation. It may begin with pain, with a blush, and with a feeling of unusual warmth. When an inflammation is first set up, it may begin in this way; but the redness is sometimes not in the form of a blush, but occurs in one particular point, and from that it spreads. If the part be a secreting organ, its secretion will become changed in its appearance, —perhaps changed, likewise, in its odour; and at the same time it is generally increased in quantity. The pain and the redness increase in degree, and also in extent; and then a swelling occurs, or tension; or swelling and tension both. The parts swell to a certain point; and if they cannot swell farther without difficulty, they become tense. As the inflammation proceeds, the secretion of the part generally diminishes again; though perhaps it does not come down to, or does not descend below, its natural amount; but the secretions still remain unhealthy in appearance, and, perhaps, also in smell. As all this goes on, or when it arrives at a certain point, the constitution begins to feel its effects. The pulse becomes quickened; and it likewise becomes variously altered in its volume, firmness, strength, and regularity. Thus the constitution sympathizes at last. The affection of the pulse is not always according to the danger; for in mere inflammation of the tonsils, or in mere rheumatism of the joints, both of which are unattended by danger, you will sometimes find the pulse as rapid and as violent, or perhaps more so, than in many dangerous inflammations. The same remark may be made with regard to the temperature. The temperature of the whole body will sometimes be greatly elevated, although the inflammation may be one of no danger. In a case of mere acute lumbago, I found the pulse at 160, and the heat of his whole body 107°. I find, in a note which I made, that he required no blood-letting at all;—that he merely took *vinum colchici*, for three or four days; and yet that his pulse was 160; and by the thermometer placed in various parts of

the body,—under the tongue, and in the axilla,—the temperature was found to be not less than 107°. The heat frequently varies, too, in different parts of the body.

Besides the alteration of the pulse and the temperature, the patient becomes restless,—uneasy in any position; and complains of general soreness. The whole surface of the body frequently becomes sore;—the patient feels tender, he says, all over. The head frequently becomes painful, and likewise the loins; and sometimes the pain in these two parts, is among the severest constitutional symptoms. The constitutional derangement extends to the secretions; so that most of them become diminished and altered; and from this circumstance you will have, in the first place, thirst. The tongue will be dry or white; and sometimes, if there be much gastric disturbance, it is yellow; or if there be little strength, dark. The skin becomes dry, though in one particular inflammation,—active rheumatism,—it generally falls into profuse sweating. The urine becomes scanty; and though it remains clear, it is high coloured, and has a strong animal smell;—it smells something like gravy-soup. The bowels become torpid; and the fæces unhealthy, both in colour and smell. These are all instances of diminished or altered secretion.

Now these constitutional symptoms altogether, are called by Cullen and his followers *pyrexia;*—not fever, but pyrexia;—fever being the name given by them to certain distinct specific diseases. Some persons denominate these symptoms *fever*, under all circumstances. We have no English word for this term, "*pyrexia*," except we use *feverishness;* but "*ish*" implies only a slight degree of any thing; whereas the pyrexia may be very great; and therefore the term "*pyrexia*" is always better. The word is used by Cullen to distinguish this constitutional excitement, in all circumstances, from those specific diseases, which (whether remittent, intermittent, or continued) he calls *fever;*—to distinguish it from fever properly so called. However, some persons, aware of the confusion which might arise from calling these symptoms *fever*, and other specific fevers (such as typhus) *fever* also, denominate these symptoms, when they are dependent upon inflammation, or some other local cause,—*symptomatic;* and they call the others,—fevers, properly so termed,—*idopathic* fevers;—fevers dependent solely upon themselves,—grounded by themselves. You will, therefore, find these symptoms (which are sometimes called "constitutional excitement,"—"constitutional derangement,") denominated by some writers, "symptomatic fever;" to distinguish them from *real*, specific fever, which they call "idopathic;" but you do not find in Cullen the word "*fever*," given to this state in general; but that he uses the word "*pyrexia*." For the purposes of clearness, it can make no difference whether, in the case of inflammation, we say *pyrexia* or *symptomatic fever;* for all that is necessary is, that we should make ourselves understood.

It very frequently happens, that when the local disease first

begins,—before it has increased to such an amount as to quicken the pulse, and induce the other symptoms which I have mentioned,—the person complains of chilliness, a general soreness, and even rigors, so that he shivers with cold; the pulse at this time being small, the face pale, and the skin rough. From its deprivation of blood, and its low temperature, it is rough; and is called *goose's skin,—cutis anserina;* and this state altogether is called *horripilatio.* After the existence of these symptoms,—this cold stage,—for a certain time, the inflammation appears; and the excitement of the whole constitution gradually comes on. Sometimes, therefore, inflammation begins; and after a certain period is attended with constitutional excitement; but sometimes, the moment inflammation begins, the system falls into a cold stage, like fever;—exactly as happens in the cold stage of an intermittent; so that the local inflammation appears simultaneously with the constitutional symptoms.

The general symptoms are usually proportionate to the intensity and the extent of the local inflammation; and likewise to the importance and sympathies of the organ affected. Sometimes, as I have already mentioned, the general symptoms are out of all proportion in their violence; so that if you depended upon them, and did not ascertain the state of the part affected, and recollect its nature, you might suppose the patient was in the greatest danger, when that was not the case. If you found an individual with a temperature of 107°, and a pulse of 160, you would suppose him in eminent peril, if you did not ascertain that the inflammation was inconsiderable, or was seated in a part not at all necessary to life,—not at all of importance to the system; whereas, the same derangement attending inflammation of an important organ, or attending a very extensive inflammation of another organ, even not so important to life, would point out the greatest danger. You see, therefore, from all I have stated relative to the colour of parts after death, and the excitement of the system in inflammation, a proof that what I before remarked is well founded;—that, generally speaking, we are not to depend upon one symptom,—one circumtance, in a case; but must always take into view as many particulars as we can ascertain.

Besides these local and these general symptoms, the functions of the part inflamed are disturbed. This I have already mentioned, so far as the secreting organs are affected; but other organs are likewise disturbed. If it be the brain that is inflamed, you have delirium. If it be the lungs that are affected, you have dyspnœa. If it be the stomach, you have vomiting. If it be the intestines, you have either constipation or diarrhœa. If it be the bladder, you of course have a frequent and painful desire to make water.

It is not, however, merely these disturbances,—these changes, that take place. The blood itself becomes changed in inflammation. The red particles separate so fully from the fibrin, that this fibrin generally remains colourless and transparent at the top; and, when this occurs, it is said to have a *buffy coat.* There must some change

take place in the blood, for this phenomenon to occur; and, as soon as you remove a portion of blood from the body, you find that some alteration has taken place; for such are the effects. Occasionally the fibrin,—white above and clear from the red particles which are below,—is drawn into such an excavated form,—its centre so depressed, that it resembles a cup; and such blood is called *cupped*. Blood may be buffy *without* being cupped. The red particles may separate entirely from the fibrin, and leave a buffy coat; but sometimes, in addition to this, the fibrin is drawn into an excavated form, so that it is buffed *as well as* cupped.

Occasionally, this buffy appearance of the blood takes place, it is said, without inflammation. It is usual in pregnancy; but then really a pregnant woman is in an inflammatory state;—not a state of actual inflammation; but the condition of the womb is really inflammatory. You see that in pregnancy the whole body frequently wastes. The eyes become hollow; and the whole health, for the most part, suffers a little. The pulse becomes very quick,—quicker than in health; and all the blood-vessels of the womb become greatly enlarged. The womb itself, if it be not in a state which justifies us in calling it inflammatory, is, nevertheless, in a state of such great activity, that it comes as near to inflammation as possible. And, in truth, with regard to other periods of generation,—when animals are "in heat," and copulation takes place, the genital organs become violently red,—violently hot,—perhaps blackened with blood,—as if they would burst; and all the blood-vessels around throb. If that state ought not to be called *inflammation*, still it is very clear that it is all but so; and whatever word you choose to employ, you must look at it as physiologists and pathologists. We cannot therefore wonder that, in pregnancy, the blood should frequently be buffy.

But this state of the blood is sometimes absent in inflammation. You will find a patient undoubtedly labouring under a most violent inflammation; and on using the remedies for that affection, you produce the most decided effects, and cure him; and yet no buff may be present in the blood. This is by no means uncommon in bronchitis; where a patient has a rapid pulse, and great heat of body; cannot turn in bed without coughing; suffers under a difficulty of breathing, so that he is obliged to breathe in a shallow manner; cannot expand the lungs without extreme soreness, tightness, and violent cough. The tongue is white, and violent pyrexia is present; and if you bleed, you produce instant relief to the patient; so that both the symptoms and the treatment prove the existence of inflammation. The blood in many, *many* cases of bronchitis will not show the slightest morbid appearance; whereas, if it were another membrane that was inflamed, instead of the lining membrane of the air tubes (as, for instance, the pleura) the smallest quantity of blood that you could take away, would most likely show an intensity of buff, and be cupped in addition. The absence of this buffiness of the blood, is by no means a proof that there is not inflammation; but, if it be present, it is generally in proportion to the violence of

the inflammation. If you were in doubt as to whether the patient is labouring under inflammation or not, the appearance of this buffiness might justify you in concluding, that the symptoms which you suspected to be inflammatory really were so. The absence of it is no proof at all that inflammation does not exist; but the presence of it will, in doubtful cases, very much confirm your conclusions, that the symptoms you were treating were inflammatory. The buffiness, however, is not necessarily in proportion to the *danger* of the inflammation; because in acute rheumatism, where there is no danger whatever (though sometimes there is danger in acute rheumatism, from internal inflammation) the blood will generally be intensely buffed, and not unfrequently intensely cupped at the same time. You are, therefore, usually to consider this as a mark of inflammation, or of an inflammatory state; but its absence will not warrant you in saying that there is no inflammation; and the intensity of the buffy or cupped state, is not to be considered by you, as a proof that the inflammation is of an exceedingly dangerous character.

Many particular circumstances are necessary to be observed in regard to this phenomenon. The first cup will often be buffy; while the second, taken within a minute or two, is much less so, or perhaps not at all. When this circumstance occurs, I believe the difference generally arises from the amendment of the patient; for the beneficial effect of bleeding is sometimes very striking;—it sometimes checks the inflammation immediately. One may conceive that a certain portion of benefit, in such cases, takes place before half the blood we intend to withdraw is removed; and when the second cup exhibits less buffiness than the first, we may ascribe it to the actual amendment of the patient. The fibrin which forms the buffy coat, is found to be more abundant in inflamed, than in healthy blood; and it is actually found,—at least we are told so; though I have observations of my own upon the point,—that the quantity of the fibrin varies in different cups, taken from the patient at the same bleeding;—that the blood of the first cup, shall actually contain more fibrin, than the blood of the second;—that the bleeding actually induces a change in the blood itself;—that not merely the buffiness, but the quantity of fibrin, whether it form buff or not, is found to vary in different cups; and that it is generally most abundant in the first cup.

Before, however, I proceed to consider the cause of this phenomenon,—buffiness,—I must say a few words upon the coagulation of the blood in general. It has been contended by some, that the formation of the coagulum is to be attributed to the death of the blood. But this I cannot assent to, and for this reason;—a coagulum will often become organized; vessels will actually form in it;—not merely shoot *into* it, but form *in* it, and unite with the surrounding healthy parts. I therefore cannot ascribe coagulation to the death of the blood. Sir Everard Home declares that he has seen

vascularity in a coagulum when detached,—when there was no vessels at all to shoot into it; but when, by its inherent vital power, it had produced vessels. I cannot believe, therefore, that the coagulation of the blood is the effect of its death. John Hunter, on the other hand, ascribed the coagulation of blood to its life. I cannot, however, assent to that opinion either. Freezing is known to kill eggs; and that process must be supposed, therefore, to kill blood; but if you freeze blood and then thaw it, the moment it becomes liquid it coagulates,—just as though it had never been frozen. You must suppose this blood to be actually dead; and its subsequent coagulation, therefore, cannot be ascribed to its life. Sir Charles Scudamore says, that when blood coagulates, a certain quantity of carbonic acid escapes; and that the blood coagulates sooner, accordingly as the circumstances in which it is placed favour the escape of carbonic acid. Consequently he ascribes the coagulation of blood to the escape of carbonic acid. Now the more blood is exposed,—as, for instance, by being allowed to trickle down the arm, instead of coming immediately in the receiver; or by being received into a large shallow basin, which presents a greater surface to the atmosphere, instead of into a small vessel; or by being received into a vessel calculated to retain the heat, and consequently not allowing the blood to cool so rapidly; and more especially by being received into a vessel actually warm;—it is said that, in all these circumstances, the escape of carbonic acid being favoured, the blood coagulates the sooner. This may be all true; but we have very high authority,—as high authority as we can wish for, (namely, that of our own professor, Dr. Turner*), for stating, that no carbonic acid escapes from the blood during coagulation. When we consider that, in the same dead body, we have a quantity of blood liquid in one part, and coagulated in another,—and nothing is more common than to find this the case in the different cavities of the heart, and in its different large vessels,—I cannot ascribe the coagulation of blood either to its life or death, or to its escape of carbonic acid. I therefore beg to say, that I do not know why blood coagulates. I am not satisfied with the reasons that have been given; nor am I not prepared to advance another reason instead of them; and it is always a great point gained to know one's ignorance.

The buffiness of the blood is certainly affected by the slowness of the coagulation; so that if the blood do not flow freely at first, but does afterwards, the quick coagulation of the first cup may not give the red particles time to subside; and this may prevent its being buffy. Hence you see that the quick or slow coagulation of blood, must effect its buffiness. As blood coagulates the sooner the more it is exposed, and therefore the more slowly it trickles down the arm, a thus increased quickness of coagulation, may prevent blood from being buffy which otherwise would be so; and when it comes

* Dr. Turner, the able Professor of Chemistry in University College, died in 1837.

out more freely into the second cup, it may coagulate more slowly; and then, if there be a disposition to buff, the buff will form; so that it is not at all uncommon to have no buffiness in the first cup, but to find it in the second. Therefore, although a patient may have improved from bleeding, and have a disposition to form less buff in the second cup than in the first, yet the accidental circumstance of its trickling down the arm into the first cup, may give rise to an opposite occurrence, and may counterbalance the operation of the benefit. You may have buffiness in the first cup, and none in the second, from the improvement of the patient; or you may have no buffiness in the first, and find it in the second, notwithstanding the patient has improved, from the accidental circumstance of the second cup coagulating less speedily than the first.

But although the quickness and slowness of coagulation may affect the formation of buff, yet they are not the cause of it; for it has been known that, of two portions of the same blood, one has continued fluid ten minutes after the other had begun to form buff, and yet has shewn no buff. When the stream of blood is exactly the same, causing the blood to flow into cups with equal rapidity, you will sometimes find the difference of buff to be exceedingly great; and you will sometimes find the buffiness to be the same when one cup has coagulated very slowly, and the other very quickly. Dr. Stoker has given us some experiments upon this point, in his "Pathological Observations."* He has furnished twenty-seven experiments, in fifteen of which buff was formed, while in the other twelve it was not. Among the twelve in which no buff was formed, no coagulation took place in three of them in less than from twenty to forty minutes; and in four there was no coagulation for eight minutes. There was abundance of time, through the slowness of coagulation, for the red particles to separate from the fibrin; and yet the result was as I have stated; whereas, in the fifteen in which buff was produced, not one specimen delayed to coagulate longer than fourteen minutes; and in all but three, coagulation took place in five minutes; and yet buff was produced. The real cause, therefore, of the buffiness of inflammatory blood, certainly is not the slowness of the coagulation; but from what it proceeds, I do not know. It may be owing to the thinness of the fibrin; for it appears to be a fact, that the fibrin of buffy blood, is both thinner and more abundant than that of other blood. If it be thinner, one may conceive that the red particles will more easily separate from it, and subside to the bottom. That *may* be the reason; but I do not say it *is*. As the quantity of fibrin is known to vary during the flow of blood, so probably may the thinness; and this may be the reason why blood which shewed buffiness in the first cup, exhibits none in the second;—the blood being thicker, the red particles do not so easily separate. However, the buffiness of the blood is not proportionate to the slowness of the coagulation. Dr. Stoker's experiments

* "A Treatise on Fever," by William Stoker, M D. London, 1817.

confirmed the opinion I had previously formed, from observation and reading; yet I believe it is true, that buffy blood generally coagulates more slowly than other blood; although I do not ascribe the buffiness to this circumstance. The slowness of coagulation may be in a great measure owing to the thinness of the fibrin; for if the fibrin be thin, it will probably be less disposed to solidify. It is said that the mere celerity of the circulation, does not effect any changes in the quality of the blood;—that it is not because the pulse is quick in inflammation, that the quality of the blood changes. Sir Charles Scudamore says for example, that where there has been great celerity from pure fever or exercise, no buff has been observed in blood taken away. This, however, has been denied by others.

But although inflammatory blood, showing buff, generally coagulates more slowly than other blood, yet the buff coagulates, if there be strength of body, very firmly,—more firmly than the crassamentum in health. However, the firmness and the cup-like form, are usually proportionate to the strength of the patient; but it is to be remembered, that the firmness of the coagulum is sometimes very great, without there being any cupped appearance. Certainly the firmness of the buffy coat is usually proportionate to the strength of the patient; and the firmness and cupped form are said to be greater (though I do not know that they are) in inflammation of fibrous membranes (such as aponeuroses, ligaments, and tendons), and in inflammation of serous membranes, than of other parts.

If it so happen that the buff of the blood be not firm, then the blood is said to be *sizy;* and when the coagulum of blood is soft, whether it be buffy or not, generally, I believe, you will find the serum too abundant;—at least when the blood is watery, you will usually find the coagulum soft, whether it be a red coagulum or a buffy one. Two writers, Trail and Gendrin, (one in our own country, and one abroad), say that the serum of inflammatory blood is altered in quality;—that it contains twice as much albumen as is found in health.

The cupped appearance of the blood, independently of the buffiness, is very much affected by the size of the vessel into which you draw it. If you extract the blood of a patient into a tea-cup, you have an infinitely greater chance of finding it buffy, than if you draw it into a hand-basin. The larger the vessel, the less is the disposition to form the buff, and likewise to form the cupped appearance. For accurate observation, blood should certainly be drawn into small vessels.

These are the gross changes, if I may so speak, in the blood; but some writers say that there are still more minute changes. Dr. Hastings says that, with a microscope, he found the blood in inflamed capillaries of a deeper colour than usual;—as it were, broken down,—homogeneous,—with no appearance of red particles. The remark does not apply to the general blood in the system; but to that of the inflamed vessels themselves. He says that, in three experiments, there were flocculi in the inflamed vessels; which

which disappeared as he directed his eye toward the healthy vessels. What these flocculi were, I do not know. Whether they were exceedingly minute coagulations of lymph, formed from the slow motion of the blood,—for it moves more slowly in an inflamed part,—and which were re-dissolved when they reached the vessels where there was a proper motion, I cannot tell.

It is a general observation, that the blood is very black in the neighbourhood of inflamed parts; and when you apply leeches, it is not till the latter end of their application, and perhaps not till after several applications, that it becomes bright. This is a fact. You will find that the blood which comes away first, is generally very black; whereas the blood that streams afterwards, will become brighter; but it will sometimes remain black, till the second or third application of leeches. I have observed this frequently; and I presume it arises from this circumstance;—that the blood, from moving slowly, acquires more of a venous character. I have known the blood, times innumerable, to be black on the first application of leeches; and I once knew the blood, in a case of chronic inflammation of the liver, highly offensive; so that almost as soon as it was removed, it went into a state of putrefaction; but as leeches were applied day after day, it became brighter and brighter, and at last regained its natural odour and nature. It would be wrong to consider inflammation as merely affecting the solids; it affects likewise the blood itself.

Inflammation may terminate in complete health of the part. The part may, in a direct manner, regain its former state; and when this is the case, it is said to terminate in *resolution.* But generally, when there is this resolution, there is some increased secretion, either at a distant part, or (if the part affected be of a secreting character) in that part itself. If it be a serous membrane, there is more or less effusion; if it be a cellular membrane, there is a more or less œdematous condition, which you can observe externally. But if these effects be very slight,—only temporary, perhaps no inconvenience is produced; and the termination of inflammation is then said to be in "resolution." If, however, it be a serous membrane that is attacked, and there be a copious secretion, it is said to terminate in *effusion.* If it be a cellular membrane that has been inflamed, and it does not terminate in resolution, a new fluid is formed, called *pus;* and the formation of this new fluid is denominated *suppuration.* If it be a mucous membrane which has been affected, you generally have a great discharge either of mucus or pus; so that you may have suppuration either from a cellular or from a mucous membrane. It is actually pus that is formed, in inflammation of a mucous membrane; nay, you likewise have pus produced from the interior of a vessel. But it is right to say, that although authors call these "terminations," yet these copious secretions are not necessarily terminations; and that when they begin, it is not a matter of course that inflammation shall end. We ought rather to say, I think, that inflammation sooner or later induces

effusion, or induces suppuration; because the inflammation does not always cease when they take place. Although the part may suppurate, or fall into a state of effusion, still these processes may be inflammatory. You may still have to go on with anti-inflammatory measures;—you may still have heat, pain, tenderness, and all the marks of inflammation. We ought, as I have just observed, rather to say that inflammation, sooner or later, induces these changes; or that these occurrences take place in inflamed parts;—the inflammation subsiding or not, just as the case may be. Inflammation may terminate, however, not in health, (either directly or after these processes), but in *death*, either general or local. You may have inflammation destroy life, without any farther change taking place, than the occurrence of inflammation itself. It is very common to see persons die of enteritis, without mortification or any other change than inflammation. It sometimes happens, however, that inflammation does not destroy general life, but the life of the individual part; and then it is said to terminate in *mortification*. But the inflammation may still continue,—not in the dead part, but in the parts around; and may extend farther, till more parts die; or it may not;—just as the case may be.

I will now speak particularly of these various "terminations," as they are called; the first of which,—resolution,—is really a termination. When an inflammation is resolved, all the symptoms decline, and no fresh symptoms arise; and this is essential to the character of resolution. In this state, the urine generally deposits an abundant red sediment. When the inflammation is going on, the urine is generally high-coloured, but clear; but when the inflammation subsides, there is usually a copious red sediment; and the reason of this, as given by chemists, is the following. In healthy urine there is lithate of ammonia, which is pale and white; as also a yellow colouring matter, the nature of which is not known, but which is thought to be probably a modification of lithic acid. If to lithate of ammonia out of the body, you add what are called the *purpurates*, you immediately produce a pink substance,—such as you find in hectic fever; and if the urine have its usual yellow colouring matter, a mixture of that with the pink substance, produced by the purpurates and the lithate of ammonia, gives a red colour;—pink and yellow mixed together, form a red colour. In this diseased state of things, nitric acid (as chemists tell us) is formed in excess in the urine; and acts upon the lithic acid,—converting some of it into a new acid, called *purpuric*. This purpuric acid, uniting with the salts of the urine, makes the purpurates; and these purpurates, mixing with the lithate of ammonia, (which is always in the urine), produce a pink deposit; which pink deposit, united with the yellow colouring matter, becomes red. The lithates of ammonia and soda are formed in excess in the urine during inflammation; and nitric acid is produced; which, as I have said, acting upon the lithic acid, produces purpuric acid; so that the purpurates are formed. These, mixing with lithate of ammonia, produce a pink substance; and

when this unites with the yellow colouring matter, the colour is changed to red. This is the reason why the deposit is red. The reason why the urine is red without sediment, till the inflammation declines, is this;—the same substances are in the urine, but held in solution during the activity of the complaint; but when it declines, an excess of lithic acid is formed, producing super-lithates; and these are very insoluble; and therefore a great portion of them falls down in the form of a precipitate. Hence you have the red sediment. This is the explanation given by one, who understands these things better perhaps than any other man in Europe;—I mean Dr. Prout. You find these changes in the urine;—the deep-red colour, with transparency, during the activity, and the copious red deposit during the termination of the disease. You find these very same things from the most common cold; and certainly often in the same abundance.

If, however, the inflammation do not terminate in resolution, but produce such an effusion as from its quantity may do harm, then, when the symptoms of the inflammation subside, (or, indeed, whether they subside or not), you have a fresh set of symptoms come on, from the compression of the parts. For example,—if the pleura has been inflamed, and the inflammation induces at last copious effusion, after the pleuritis has subsided, you have a fresh state of symptoms, dependent upon compression of the lung. When there is this excessive effusion, however, in a serous membrane, there is generally something more. Fibrin is usually thrown out,—sometimes forming layers,—sometimes diffused in the serum, and forming flocculi, larger or smaller; so that the serum is turbid; and it may not only be turbid, but may have flakes in it. When serum is thus poured out by a serous membrane, it is at last often entirely absorbed while the fibrin remains; and frequently we find fibrin where there is no appearance of serum;—the serum having been absorbed, or fibrin alone having been produced. Fibrin, so poured out, has been seen in so short a time as four hours after the commencement of inflammation. Professor Thomson, of Edinburgh, says that he has seen lymph lying on a serous membrane, within four hours after he had induced inflammation. Sir Everard Home says, that he has known an effusion of fibrin form vascular adhesions in the course of twenty-four hours. So rapid are these changes, that it appears inflammation may cause an effusion of lymph in four hours; and that within twenty-four hours from the very first, this portion of fibrin may become an adhesion, containing blood-vessels. Sometimes the effusion which occurs is not serum,—is not lymph, or serum and lymph; but is pus. Thus you may have the pleura, the pericardium, or the tunica vaginalis, filled with pus; and sometimes with a mixture of pus and serum.

If the third effect of inflammation take place,—not resolution, or effusion, but suppuration,—then the pain indeed generally ceases, but the swelling which was present during the inflammation still remains; and if there were not much swelling before, perhaps there

is a good deal now. This swelling, however, does not, as when a part is inflamed, feel hard; but is for the most part soft; and frequently you may discover fluctuation early. Sometimes you cannot discover this at first; but as the fluid increases, you discover it more and more, till the fluctuation is most decided. The pain, however, does not always go away. It may decline at first; but as the fluid increases, you may have fresh pain from tension of the part. The part may become exceedingly tense from the quantity of fluid, which is afterwards absorbed, or escapes either by art or natute. There may be very considerable pain. Besides this, just as in *effusion* of a serous membrane, where there is suppuration of a cellular membrane, or of any organ, you may have fresh symptoms from pressure. That, however, depends upon the situation of the part. If the part in which the pus collects, be one which will suffer from compression, then you may, of course, have fresh symptoms from the mere compression. But besides this, if the suppuration be extensive, you have general shivering. As soon as the matter forms, or when it is forming, or soon after it, what are called *rigors* take place; and after a time you have great heat and sweating. In fact, you have what is called *hectic fever*.

This hectic fever is marked by a quick, but weak pulse; by heat of the whole surface, but particularly heat with a red flush upon the cheeks, the palms of the hands, and the soles of the feet. Sometimes the whole of these are red; but more frequently the redness is partial, forming patches; so that a portion of the cheek, the size of half-a-crown, more or less, may be intensely red, while all around is of the usual pale character. In addition to these symptoms, the patient has profuse sweating; so that as soon as he falls asleep, he is almost sure to fall into a sweat; and frequently when not asleep he still sweats. These symptoms are generally aggravated at night, and frequently also at noon; and indeed at any time when food is taken. It is remarkable to notice the effect of sleep upon the sweats. If a patient fall asleep but for two minutes, although he may not know it, it is very common to find these sweats break out; and they are frequently very partial, being observed particularly about the head and chest.

In this state of things, the sediment of the urine is not red, but pink. I should have said, that when it is red it is called *lateritious*,—looking like a brick. In hectic fever, when the suppuration is going on, the sediment is of a pink colour. The chemical changes are precisely the same;—the purpurates acting upon the lithates, and producing this pink colour; but this pink colour is not changed to red; because it appears that the yellow colouring matter of the urine is absent, and therefore the pink of the purpurates and lithates remains unchanged. The intestines often pour forth a fluid as abundantly as the skin; so that you have purging; and not unfrequently the purging alternates with the sweating; so that if you have an increase of the sweating, there is a decrease of the purging; and *vice versa*. This sweating and this purging are called *colliquative*,

—melting the patient down; and hence the name. The alimentary canal often becomes inflamed; and when you open a patient who has laboured under this state, you find the mucous membrane red,—sometimes ulcerated. The tongue at length becomes red. You may see it yellowish, or of a deep brown colour; but for the most part it is red, either on the surface, or at the tip, or at the sides and tip. The mind generally becomes very quick; the patient is excessively alive to every thing; and, at the very last, a degree of delirium takes place. When that occurs, it is usually the precursor of a fatal end. I need not say there is usually extreme debility and wasting of the body.

It is to be remembered, however, that these symptoms, called "hectic fever," may occur without any suppuration. They will occur, I know, from mere depression of mind; they will occur frequently in women from excessive suckling;—from suckling too much, or suckling too long. All these symptoms, without suppuration, will sometimes remain for a great length of time; and the patient at last, by proper management, do very well.

If the pus, which is formed, be collected into a mass, we term the collection an *abscess*. Supposing the formation to take place in a cellular membrane, fibrin is thrown out; and the cellular membrane exterior to the fibrin, becomes more dense and more vascular. A cavity is formed in the lymph, and contains the pus; and the exterior of the cavity is formed of the condensed cellular membrane. This lymph, forming the cavity, is gradually absorbed in one part; and that part is usually one which is nearest to the surface, or some exit of the body; so that if it be nearest the surface of the body, the portion nearest the surface is absorbed; or if it be near the intestines, the portion nearest the intestines is absorbed;—and so on. Wherever there is the easiest exit for the contents, there the fibrin becomes absorbed. This is a very extraordinary and beautiful provision of nature. If there be a possibility of the pus escaping into a part where it might do harm, adhesions are formed all round that situation, so as to prevent the escape of the pus into it. Nothing can be more wonderful in pathology than this;—than the process of nature in giving exit to the matter, in a way the most calculated to facilitate this discharge, and in taking steps the best calculated to prevent mischief.

I should mention, that I have put together all the arguments relating to the coagulation of the blood,—in fact, every thing I know upon the subject,—in one of the notes on the blood, in my translation of Blumenbach's "Physiology."* I feel a little delicacy in referring to a book of my own; but I trust you will excuse me if I should sometimes have occasion to do so.

If then there be any danger of mischief arising from the circumstance of the walls of the abscess becoming thin, and letting out the

* See Appendix, No. II.

pus into a cavity, or part of the body where serious consequences would result, (as, for instance, into the peritoneum), then a great deal of additional lymph is frequently thrown out,—glueing the various parts together; in order to prevent, as much as possible, the liability of the escape of the pus in an improper direction. Thus you see that nature usually thins the walls of the abscess, at that point which is most eligible for the escape of the pus; and thickens them where it would be dangerous for the pus to escape.

The absorption at the former point, wherever it may be, goes on. If it be near the surface, we see the chief swelling at one particular part; and the collection is said to *point*. At length a minute opening is formed, and the matter escapes. When the latter occurrence takes place, and the cavity is thus opened, minute red granules are seen within,—highly vascular, soft, and covered with pus. In fact, they secrete the pus. Sometimes the opening at which the matter escapes, although small at first, enlarges; absorption takes place to a great extent; ulceration runs on to a considerable distance, and perhaps lays bare the cavity very much.

These red granules which secrete the pus, grow larger and larger, till the cavity is filled up. This process is called *granulation*. When the cavity is entirely filled up, portions of skin form upon its surface, and portions of the surrounding skin are prolonged into them; so that you have a double source of new skin. Fresh skin appears in insulated points; and the healthy skin around shoots prolongations into it. In this way the surface of the granulations becomes covered with skin, and is healed. The smaller the granulations are, the better; for if they be large, they are generally spongy; and the common people then denominate them *proud flesh*.

From the loss of cellular substance which takes place in the formation of the abscess,—for the cellular membrane is more or less destroyed; and from the contraction of the new parts,—for these granules, which were very vascular at first, become less and less so; —from the loss of the cellular membrane, and the contraction of the new parts, when all is healed, we see a depression. If it be a very minute abscess,—such as is only called a *pock*, (as in small-pox), then you have merely a little depression,—a pit; but if it be a more extensive formation of matter that has taken place, then you have *scars*. They are exactly the same thing, only on a different scale. The contraction of the new parts, and the loss of the cellular membrane, are sometimes so great, that the joints cannot be extended; and the arm becomes bent to the body, or the fingers bent down to the hand.

It is said that pus is sometimes collected in an abscess, in this way, without any lining of lymph; but when the latter is absent, the pus is almost always diffused. You frequently have pus formed in the cellular membrane in a diffused manner, so that it will run to a great extent and do very serious mischief;—producing, wherever it spreads, new inflammation and the most frightful devastation.

This is observed in that form of erysipelas styled *erysipelas phlegmonoides*. Where suppuration takes place in the cellular membrane, uncontrolled by a cup of lymph, it often runs on extensively; and sometimes a whole arm, or a whole thigh, is in this way covered by a sheet of matter.

You will, however, sometimes have a formation of pus, and an absorption of the skin and cellular membrane, without any collection of matter. This is seen every day in the case of the throat, and sometimes upon the skin itself; but more frequently upon a mucous membrane. If a mucous membrane be attacked by a slight inflammation, the epithelium may be absorbed, together with a small portion of the mucous membrane;—in fact, you may have an ulcer; and that ulcer will secrete pus, without there being a collection of matter underneath. In an abscess, the matter is formed in the cellular membrane, or in a solid structure, and tends outwards; but frequently, in a mucous membrane, the process goes on inwards. Nothing is more common than to see this in the throat. The surface, which is a little inflamed, becomes abraded; matter is formed upon it; and in that way you have an ulcer without the previous existence of an abscess. If the part heal, it is afterwards filled up;—in the same way as if the matter had been collected in a cup, in the cellular membrane.

Pus, if healthy, is an opake fluid, yellow or white, homogeneous, short, and creamy; so that, if you take a drop between your fingers and separate them, it breaks. The drop divides into two;—does not hang in strings. It is generally bland to the taste, and without smell. Some say it is rather *mawkish;* but one never thinks of tasting it, except in the case of a gum-boil, or other suppuration in one's own mouth. If it be perfectly healthy, it is inodorous and bland; or, at the utmost, there is only a mawkish taste. It is said to be neither acid nor alkaline; although, by exposure to the atmosphere, it turns sour. It is also insoluble in water. It contains globules; and hence it is distinguished from pure mucus, by being placed between two bits of glass, and then looked through at the sun. From the existence of the globules, you have an irridescent appearance,—the colours of the rainbow. This is not the case with mucus; for mucus contains no globules. When pus is first secreted, however, it is said not to be globular; and that these globules do not appear in it, till it has been poured forth from the vessels for fifteen minutes. Mucus, again, is not short, like pus. If you take a portion of mucus between the finger and thumb, and separate them, you find that it drags out into threads;—it does not break off short, like pus. I believe it is known by those who have had much to do with gonorrhœa, that, when the disease is violent, the secretion from the mucous membrane is purulent;—it regularly breaks off between the fingers; whereas, when the disease declines, and pure mucus is again secreted, a person has a full conviction that he is getting better, by finding that the discharge will drag out between the finger and the thumb.

Persons have endeavoured to discover the difference between pus and mucus, by chemical tests. John Hunter says, that he found pus easily coagulate by a solution of muriate of ammonia; but that mucus would not. Dr. Darwin (Junior) says, that a solution of caustic potass does not dissolve pus; but makes it a viscid semi-fluid substance;—stringy, like mucus;—not dissolvable in water; but resembling the diseased mucus of the bladder. When that viscus is in a state of chronic inflammation,—when the mucous membrane is in a state of cystorrhœa, and there is a great discharge of mucus from the surface, its mucus is very ropy, and may be dragged out to a great length; and this is the appearance which pus exhibits, if it be mixed with a solution of caustic potass. Dr. Darwin also says, that the same effect is produced, by adding to the pus sulphuric acid; whereas, if you add these things to healthy mucus, small flakes are produced, and not a stringy semi-pellucid substance. On the other hand, two modern French writers (Andral and Baumes) deny this distinction. Then you find another chemist (Grasmyer) say, that if pus be triturated with an equal quantity of water, and this combined fluid be then mixed with an equal quantity of carbonate of potass, a jelly is produced in a few hours; but that is not the case with mucus. Pus in general sinks in water, but mucus generally does not; and if pus be diffused in water, the water becomes uniformly white.

As to all these distinctions, however, the fact is, that pus and mucus run into each other. Mucus may be diseased, so as to be something like pus,—puriform; and they will run into each other by insensible degrees. In disease of the lungs, the distinction between pus and mucus has been thought most important, as tending to shew whether ulceration exists; but here the two secretions are continually mixed together. When there is an abscess of the lungs, or a number of abscesses, and matter is discharged from them, you will have, at the same time, a quantity of mucus secreted from the bronchial tubes, so that the pus and the mucus are expectorated together; and in proportion as the former surpasses the latter in quantity, or the latter exceeds the quantity of the former, you have the character of the one or the other. If the quantity of mucus be very considerable, the pus may be borne up by it in water,—not allowed to sink. Besides this, there may be an abscess in the lungs; and there may be also an excavation; and this not secreting pus, but really mucus. The lining membrane of the cavity in the lungs, at least if fresh ulceration have not taken place, may secrete mere mucus. Again, every mucous membrane which is inflamed, may produce absolute pus; so that you may see puss discharged from the lungs, when there is no ulceration at all; while, on the other hand, there may be an ulceration of the lungs; but the lining membrane of the abscess may have become of such a mucous character, that it secretes real mucus, and nothing else. In addition to this, you may have mucus from an abscess in the lungs, and pus from the bronchial tubes, (in consequence of these being in a state of

irritation), combined together in various proportions; so that the distinction between the two, is not of the importance which was once imagined.

With regard to the constitution of pus, Schwilgué (who is one of the last that has analyzed it) says that it consists of albumen, extractive matter, fatty matter, soda, muriate of soda, phosphate of lime, and some other salts. When pus is scrofulous, it is said to have more soda and muriate of soda, than healthy pus. Pus was once imagined to consist of the dissolved solids. Seeing that a cavity existed, it was imagined that the solids were melted down, and turned into pus. But then you frequently have pus, as I just now stated, when there is no ulceration at all; and the formation of pus is not in proportion to the loss of the solids. You may have, from a small abscess, an immense secretion of pus, if by chance the abscess do not heal; and yet it does not extend. The truth is, the pus is a new secretion. Whether globules are formed in it;—whether it is perfect or not, immediately;—whether fifteen minutes are required to produce the globules, and fully form the pus;—is of no consideration. The fluid which constitutes the pus is, to all intents and purposes, a secretion. Yet I believe pus will dissolve *dead* solids; although it is not dissolved solids, yet it will itself dissolve them,—making a solution of them, if they be dead. John Hunter found dead flesh dissolve very readily in pus. He put an equal quantity of dead flesh into pus, into jelly, and into water; and he found the portion put into pus dissolve very readily, while the portions put into jelly and water did not. Hence it would appear, that pus is useful in dissolving the solids when they die; and the cellular membrane continually dies in phlegmon. When an abscess is formed, the pus, no doubt, dissolves a portion of the cellular membrane; but still it does not dissolve it all; for when you open an abscess, you continually see escape portions of dead cellular membrane, which are called by the common people the *core*.

Healthy pus is called by the old writers *laudable*. I recollect, when a student, hearing good pus, instead of being termed *healthy* pus, commonly called *laudable* pus,—*praiseworthy* pus. Healthy pus should abound with globules. I may mention that one writer (M. Gendrin), says that these globules differ from the globules of the blood only in being larger, and of an opake yellow colour. Some say that the term "*globule*" is improper; that these particles are not exactly globular, but irregular in size and shape; but still all agree that there are certain particles in the pus, as there are in the blood.

Healthy pus, then, should abound with globules; but if they be deficient, and the pus be watery, then we have what is called *ichorous* pus. But there may be other differences in pus, besides a deficiency of globules. When pus is thin, like water, it is called *ichorous;* if it be thin and bloody, then it is called *sanious;* and it is called *scrofulous* if there be in it little curds; which curds, very possibly, are shreds of lymph. Pus sometimes very much resembles mucus. It does not

abound sufficiently in globules; is glairy or muciform; and will hang out in little, slight strings. When mucus, however, becomes something like pus, we call it *puriform*. Although healthy pus is inodorous, and said to be only mawkish to the taste, it frequently becomes fœtid. This particularly occurs if a bone be diseased; but in suppuration of the tonsils, likewise, it is not uncommon for the pus which escapes, or is let out by a lancet, to be most horridly fœtid. Generally, however, it is when pus comes from the bone, or the immediate neighbourhood of a bone, that it assumes this fœtid character.

I have already mentioned in how short a time lymph and fibrin have been seen effused on a serous membrane; and pus also has been seen to form in a few hours. It has been seen produced by a mucous membrane, in a few hours after inflammation has been set up; and when an abscess has been produced, matter has been formed in so short a time, as from twelve to eighteen hours from the commencement of the inflammation.

The next termination of which I shall speak, is *mortification*. This is shewn by the part becoming of a darker red than before. When a part is about to mortify, it grows of a dingy red; from red it becomes purple, and then black; and when it is once dead, from the decomposition of the matter, it changes to a green colour, and various other hues. The pain ceases; the part becomes cold; and, if it be the surface, we often see vesicles; which, although they are frequently filled with a pale fluid, yet are more frequently filled with a bloody serum. If it be the skin which is mortified, it becomes variegated; and perhaps the part crackles, too, under the finger. From the extravasation of air, the swelling increases; and the part has often a doughy feel. These are the *local* symptoms; but *general* symptoms take place. There is extreme prostration of strength, with extreme restlessness. The face becomes ghastly; the pulse becomes rapid and exceedingly weak,—perhaps intermitting and irregular. There is a general fall of the temperature of the body; and a cold clammy sweat takes place. The tongue becomes brown or black; the manner becomes exceedingly quick; and frequently a little delirium takes place. The cessation of the local, and of all the violent general symptoms, will take place just before death from inflammation, when that inflammation does not cause mortification, or any other local change;—although, when mortification occurs to any extent, you will have the very same thing. That is to say, you may have the cessation of pain, the ghastly countenance, the rapid, feeble pulse, the extreme sense of debility, restlessness, and at last death, without any mortification,—without any other local change whatever. I believe I mentioned before, that frequently from the symptoms of enteritis, you would imagine that mortification of the intestines had taken place; but on opening the body you may find no mortification,—nothing but intense inflammation.

When the parts inflamed become of a purple colour, and cold, and fall into incipient mortification, restoration is not impossible. Parts will recover that have become purple, and lost a portion of

their temperature. Even parts which have been congealed, will recover by good management; but this, I believe, takes place in man and the other warm-blooded, more than in cold-blooded animals; and professor Thomson, of Edinburgh, says that if a *whole* limb be frozen, it is never restored. A still higher degree of mortification is called *gangrene;* and the complete death of a part,—when it is dead,—gone irrecoverably,—is termed *spachelus.* In the latter case, the part is cold, senseless, black; and putrefaction follows. There are three degrees, therefore, of mortification;—the one where the parts are merely purple and cold; a second where things are more advanced, but the part is not absolutely dead; and the third, in which the part is really dead;—*mortification* being the generic term for all the three stages. When a part is dead, and putrefaction is begun, the progress of the latter depends very much upon external circumstances. The warmer the weather, of course the more readily will putrefaction take place.

If the part, which is in a state of sphacelus, be not important to life, it may be separated by nature from the body. The process of nature here is exceedingly wonderful. The large vessels, which go to the part, become plugged up;—a coagulum of blood forms in them, or adhesive fibrin is poured out from the inner surface; so that in one way or other the progress of the blood is arrested; the consequence of which is, that it coagulates to some extent above the plug, and the plug thereby becomes increased. Dr. Thomson, of Edinburgh, says, that a coagulum never extends higher than the first communicating branch; and that is what you would suppose. The blood coagulates behind the plug, nearest the heart; and you cannot, therefore, expect a plug to extend beyond the first communicating branch. He says that sometimes he has seen a vessel completely obstructed, without the formation of any plug at all;—the whole obstruction being produced by an effusion of lymph,—lymph which has become organized, and formed an internal adhesion. Nay, he says that sometimes he has seen an artery completely obstructed without any lymph,—without any plug; but simply from its becoming closely contracted;—so contracted that it would not admit a bristle. The contraction has formed as complete an obstruction to the blood, as the existence of a coagulum, or of a quantity of fibrin, would have done. He says that he has noticed the same circumstance in an amputation, where no ligature had been employed. The vessels have become so contracted, as not to admit of the introduction of a bristle; and have thus prevented all hæmorrhage. In whatever way it is done,—whether by a coagulum of blood, or by a plug of lymph forming an adhesion, or by the mere contraction of the vessels, or by any two of these,—such is the fact, that nature generally succeeds in preventing hæmorrhage from a mortified part, by obstructing the course of the blood in the larger vessels leading to it.

The process of separation is accomplished in this manner:—A

red line appears at the boundary of the healthy part, which is nearest to that which is dead. This red line, of course, is a line of inflammation; and in it ulceration takes place, which goes down in the healthy part lower and lower, till a complete separation takes place; and in this way a whole limb is sometimes separated from the body.

Of course I have been speaking of soft parts; but if a long bone die, (which is a very common thing), without any death, or any especial disease, of the surrounding parts, a new bone is formed around it. The process of nature, therefore, is quite different here, from that which is employed to separate a dead soft part. In this case a new bone is formed under the periosteum, around the dead portion; and in this way the parts exterior to the new bone (namely, the periosteum, the ligaments, and the cartilages) all become attached to it. When the old bone within the new one is detached,—completely loosened, then an opening is formed in the new bone; ulceration takes place in it at one spot; granulations occur on the inner surface; and these granulations push the old bone through the ulcerated opening in the new one;—at least they tend to do so. The aid of a surgeon is frequently of use in assisting to draw out the old bone, and enlarge the openings in the new; but this is the process adopted by nature when a bone dies. This process is called *necrosis;* and the old bone within will frequently rattle, like the kernel of a dry nut. The old bone is called *sequestra.*

If, however, it be not a long bone which is dead, but merely a plate, or a flat bone, this is separated by ulceration. Granulations form under the old bone and push it off. This process is designated *exfoliation;* because the bone comes off like a leaf (*folium*).

These are the "terminations," as they are called, of inflammation; but I should rather say, they were the *effects* of inflammation than *terminations;* because inflammation does not necessarily terminate when they occur. Inflammation frequently goes on after these effects take place; and therefore we ought to say, strictly speaking, that these are the *effects* of inflammation, or circumstances that occur from inflammation.

You will find that authors mention *schirrus* among the terminations of inflammation; but if by that they mean the schirrus which afterwards becomes cancer, they are certainly wrong; because schirrus will occur without marks of inflammation. A part, without these marks, will gradually become cancerous. It seems to be a specific disease. If, however, by *schirrus* these writers mean *true* schirrus,—mere induration, then they may be right; because one of the effects of inflammation is to harden. When a part has been inflamed for a length of time, it frequently becomes indurated; so that schirrus, in that sense, may be said to be the effect of inflammation, but not a *termination* of it; because the inflammation will go on, and the part become more and more indurated. Induration, however, is only one of such effects of inflammation as they ought to enumerate; for it

has as great a tendency to cause parts to become softened, as hardened. Induration is rather the effect of chronic inflammation; while acute inflammation rather produces softening.

Having spoken of the effects of inflammation, I now proceed to consider its duration; and this is very various,—depending much on its intensity. If an inflammation be exceedingly violent, it cannot last long; but if that be not the case, it may last a great length of time. Inflammation may exist for only a very few hours, and may certainly destroy life in the course of a day. It is sometimes so rapid, that a person shall be well in the afternoon, and die from it before the next morning is much advanced. I recollect myself seeing, last winter, a case of pericarditis, which occurred suddenly in the evening, about seven o'clock, from a lady having exposed herself to cold, by walking about the house half undressed; and she was dead before eight the next morning. Inflammation may be so acute, as to destroy life in a few hours, without any mortification, but simply from its own intensity. Inflammation may be even almost momentary; but that will depend upon the use you choose to make of words. Certainly a child is sometimes seized with a violent rush of blood to the head;—its eyes will become red;—its face flushed;—and its head distracted with violent pain. It screams; and death ensues in the space of one or two minutes. The same thing will happen in adults. After death, a great quantity of blood will be found within the cranium, and externally to it. If this state be inflammatory, it certainly proves that inflammation may be almost momentary; and that it will destroy life in this sudden manner.

But inflammation, if it be not violent, may last for many months, and even years; for if it remit, it may often be tolerably violent, and yet continue for a very long time;—its severity not remaining the same during the whole of the period. If it once degenerate into the chronic form, it may last indefinitely; and when it does so, it generally induces various changes of structure, which I will mention hereafter. When a part has been once inflamed, the redness will occasionally remain some years, without any pain or any heat. You may see this frequently after burns, and after cutaneous diseases. A portion of a scar will remain exceedingly red;—the vessels would appear to be in a state of passive dilatation. There is no pain, no heat, no tenderness; but extreme redness; and this, after it has existed a year or two, or perhaps longer, will sometimes decline; and the vessels will at last gradually recover their natural tone. After ulceration, the skin will frequently remain of a red colour, perhaps of a very dingy red, and almost of brown colour. In the case of a person who has had a sore leg, you will see that the portions corresponding with the spots of ulceration, are frequently very red, brown, variously discoloured, or perhaps nearly black.

Such are the usual phenomena of inflammation. Such are the chief symptoms; such are the general effects or terminations; and such is its course. The next point which I shall consider, is the

variety in all these symptoms, and the variety in the course of inflammation, occasioned by the nature of the *structure* which it attacks. The consideration of the varieties induced in inflammation by the structure affected, was first thought of, I believe, by Dr. Carmichael Smith; who published (in the second volume of the "Medical Communications," printed in 1788) a very admirable and classical paper on this subject. He it is, I think, who really has the merit of having first considered diseases according to the structure which they affect. He, however, considered only inflammation. Nearly ten years after this, Pinel, a celebrated French physician, adopted this same arrangement; and he, I believe, generally has the credit upon the Continent; while our countryman is overlooked. Bichat, in his "General Anatomy," afterwards pointed out that *all* diseases, in fact, might be considered according to the structure which they affect.

There are five chief structures, which Dr. Carmichael Smith considered as giving rise to the most decided varieties in the symptoms of inflammation. These are the skin, the mucous membranes, the serous membranes, the cellular membrane (including the substance of the organs), and (according to him) the muscles; but we ought rather, perhaps, to say the fibrous membranes;—such as ligaments and aponeuroses, tendons, and the periosteum.

When the part inflamed is the skin, it exhibits an intense shining redness, which is instantly removed by the pressure of the finger; and as instantly returns, or nearly so, when the finger is removed; so that you make the skin white by pressure; but almost as soon as you remove the finger, you find a blush pervading the part, and then it becomes as red as before. If this inflammation of the skin be of a simple character, and in a patch,—if there be nothing more than the inflammation of the part, the term given to it is *erythema*. It is not every inflammation which is erythema; but the simplest patch of inflammation on the skin is so designated.

The character of the pain, when the skin is inflamed, is burning and smarting; and when the inflammation subsides, it is frequently followed by the separation of the cuticle in branny particles, or scales, or even large shreds. This process is called *desquamation*.

Very frequently, when the skin is inflamed, we have vesicles appear, of various sizes; and not unfrequently there is a very great effusion of serum into the subjacent cellular membrane; so that where the skin is inflamed, the whole part becomes swollen, puffy, and œdematous. As the skin is a continuous surface, every inflammation of it which is entirely superficial, has a great tendency to spread; and sometimes when that takes place, the part first affected recovers itself; so that the disease appears to wander along the body, like a cloud;—forsaking one part, and going to another. But, on the other hand, you sometimes have the part originally inflamed still affected;—the disease having merely extended itself still farther. Sometimes the inflammation does not spread in this

way, but dips down; so that the cellular membrane below is not merely filled with serum, but becomes the subject of actual inflammation. If this occur in mere points, matter may be formed; and you have what are called *pustules*,—a number of little minute collections of pus. Sometimes they may be formed, indeed, without the cellular membrane being affected,—the surface of the skin alone being attacked; but frequently the pustules extend also through the skin, deep into the cellular membrane. Sometimes, moreover, a frightfully extensive inflammation of the cellular membrane takes place;—suppuration being very likely to occur; and then the disease is designated *erysipelas phlegmonoides;* or (as some choose to call it) *diffused inflammation of the cellular membrane.* You see, therefore, that the skin may be inflamed superficially, and remain so; or the inflammation may dip down into the cellular membrane below; and then you have all the characters of inflammation of the cellular membrane, in addition to those of inflammation of the skin. This may be considered a complicated disease;—at least an inflammation of two parts.

The second structure which gives variety to inflammation, is mucous membrane. Mucous membranes, you know, are very nearly allied in structure, as well as in all other qualities, to the skin. You will find in Bichat's beautiful "Treatise on Membranes," the analogy pointed out between mucous membranes and the skin. It is a work well worth your study. When a mucous membrane is inflamed, it becomes thicker than usual; its temperature increases; and it is tender to the touch. The pain which is experienced is dull and diffuse, though sometimes it is of a pricking character; but if not pricking, it is obtuse and diffused. When the inflammation first begins, the secretion of the part is increased. It is, however, watery, or thin; and perhaps acrid. This any one may observe in a common catarrh. When a cold begins in the Schneiderian membrane of a nostril, the nose "runs," as it is called. The secretion is increased; but is not, at first, very excessive; nor is it thick, but thin; frequently, however, it is more or less acrid. As the disease advances, the discharge becomes, perhaps, entirely suppressed. No secretion, perhaps, takes place; but, as the disease declines, the secretion increases again,—becomes excessively copious, exceedingly viscid,—perhaps offensive; and then, again, it gradually lessens. If the inflammation be not intense, the secretion remains mucous; although it may be altered in its quality,—may be diseased, still it is mucous. If, however, the inflammation be more intense than that, the secretion becomes puriform; and a still higher degree of intensity will give rise to absolute pus,—purulent discharge. All this you see in inflammation of the urethra; where inflammation is far more violent than that which occurs in the nose. The inflammation of catarrh generally produces nothing more than mucus; but the inflammation of severe gonorrhœa is so violent, as to cause the formation of pus. If, however, the inflammation be still more violent

than that which occurs in purulent gonorrhœa, you may not simply have pus produced, but fibrin will be poured out. One of the most violent inflammations of a mucous membrane, is the croup of children; and in that disease, the mucous membrane pours forth fibrin; so that the parts become obstructed, and a tube of new secretion is produced. I have seen the same occur in the urethra; where an individual, in consequence of a violent gonorrhœa, has used strong injections; the result of which was the excitement of a dreadful inflammation. Pus had been secreted before, but now fibrin; and a portion of fibrin was discharged from the urethra, exactly resembling an earth-worm in appearance, except in colour.

Occasionally, when mucous membranes are inflamed, hæmorrhage takes place from them. They become so overloaded with blood, that the vessels allow its escape, and hæmorrhage ensues. This is more particularly the case with inflammation of the mucous membrane of the intestines, and of the urethra. These membranes, I think, more frequently discharge blood when they are inflamed, than any other mucous membranes. Occasionally (but this is a more rare circumstance than the former) inflammation of the mucous membranes induces mortification, or sloughing. This is particularly observed in the throat. Now and then you have ulceration; and this generally occurs in the throat and intestines. It often takes place from the very beginning; and is not at all in proportion to the degree of inflammation. There often appears to be a strong disposition to ulceration. Inflammation of a mucous membrane, frequently degenerates into a state of chronic discharge; so that when the inflammation is over, the part continues to pour forth a quantity of fluid, without pain and without heat. This particularly occurs when a mucous membrane has been inflamed several times; and we especially notice this gleet (as it is termed) from the bronchia and the urethra. The latter is every day seen in young men; and the former in those who are old. Hence we have *catarrhus senilis*,—a gleet; a constant discharge from the mucous membrane of the air-passages, without any inflammation.

If we examine these membranes after death, when they have been inflamed, we find them thicker and softer than natural. If the inflammation should have continued very long, they will frequently become very soft and thin; but, on the other hand, just the reverse is frequently observed. If inflammation have induced softening, you may rub them off with the finger, from the cellular membrane beneath. Sometimes, however, these mucous membranes become indurated. It is no proof, if you find a mucous membrane soft,—as you frequently do in the case of the stomach,—it is no proof that it has been inflamed. I believe that a part will occasionally become softened, without any inflammation;—at least, I know that the softening is frequently out of proportion to any inflammation that has existed. Generally, when a mucous membrane has suffered acute inflammation, it is found to be thicker and softer than natural. It is much

more rare to find it hardened. The usual effect of acute inflammation, is to soften parts; but if, by chance, it should occasion a deposition of fibrin, though it has itself a tendency to induce softening, yet the lymph so poured forth being hard, will cause an appearance of induration. Baron Dupuytren, the eminent French surgeon,* and Dr. Thomson, of Edinburgh, found inflamed arteries softened; and the stomach, the bronchia, and the heart, when inflamed, are continually found soft. This is the more general effect, therefore, of acute inflammation of mucous membranes.

Sometimes, when a mucous membrane has been severely inflamed, you will find it almost black. Through the mere congestion of blood, you will find it look dark, as if it were mortified; but, on handling it, you find it not lacerable, like a mortified part, but still pretty firm and solid, and devoid of fœtor. Great mistakes have been continually made in the inspection of bodies. After inflammation of the intestines, you often find portions of them almost as black as your hat, without any particle of mortification; and frequently such cases have been pronounced, at once, to be mortification of the intestines. Mere congestion of blood will make a mucous membrane almost black; as is seen in the case of the genital organs of rabbits during heat. You will find the error to which I have alluded, pointed out by Dr. Baillie in his "Morbid Anatomy."

It is a general remark that the feverishness,—the *pyrexia* attending the inflammation of a mucous membrane, is comparatively mild. The pulse is generally soft, although quickened; and the more frequent the attacks of inflammation, in any individual mucous membrane, the more mild they are, and the more early and profuse is the discharge.

If the part inflamed be a *serous* membrane,—such as the arachnoid, the pleura, the pericardium, the peritoneum, or the tunica vaginalis, —the pain is for the most part acute, darting, lancinating. The pulse is not soft, as in the case of inflammation of a mucous membrane; but is generally hard, though by no means always. It is a general, but not a *universal* remark, that the pulse is hard. The inflammation causes here, not a secretion of mucus, but a copious effusion of serum; which is sometimes limpid, clear, and of a lemon colour; but is generally turbid; except, perhaps, in inflammation of the head. The serous collection is generally of a yellowish colour, like whey; and sometimes it is puriform;—the fluid, in many portions, resembling pus; although other portions of it may be more like serum. Sometimes, however, absolute pus is produced; so that the pericardium has been seen filled with pus. Not only is serum effused, but fibrin is likewise poured forth; the appearance of which is very various. Sometimes it forms a jelly-like yellowish mass; sometimes minute shreads or flakes are seen swimming about the fluid; and sometimes it forms regular layers, looking like so much skin. These deposits of fibrin, will at length grow vascular; and when vascular, they will adhere to the surrounding serous mem-

* This prince of continental surgeons died since the above was delivered.

brane; and at last become thin again, and in all respects resemble cellular membrane. Hence they have been frequently called *false membranes*. A false membrane is originally nothing more than an effusion of lymph; which has become vascular, and adherent to the surrounding serous membrane from which it has been poured forth; and has then become, in all respects, like cellular membrane.

This effusion is undoubtedly fibrin. Some have thought it to be one thing, and some another; but, in an article contained in the twelfth volume of the "Medico-Chirurgical Transactions," Mr. Dowler shews it to be fibrin. I never had any doubt upon this subject; and many persons coincided with me in opinion. However, Mr. Dowler has brought forward evidence in proof of it. You will find it stated, in Andral's "Pathological Anatomy," that Lassaigne, a French writer, has also ascertained the same circumstance experimentally.

In this deposition of fibrin, you will find two portions;—one solid, and the other fluid. The solid is fibrin itself; but within the various portions of the solid mass, between the layers, (or, more properly speaking, in cells), is found a fluid which is ascertained to be albumen. When these depositions have become adherent, they may be injected from the surrounding parts; but,—as I mentioned with respect to a coagulum of blood, that it has been seen to have vessels of its own, independently of its connexion with the surrounding vessels, (although such vessels become at last connected with those that surround them),—just in the same way these depositions of fibrin will, before they are adherent to the surrounding serous membrane, become vascular. Vessels will form in them; and within them there has even been found pus, while they were still unconnected with the surrounding parts. Andral says that he has distinctly found a fibrinous concretion, unconnected with the surrounding parts, swimming in liquid in a serous cavity; and frequently, even in such as these, he has found pus. It is said that the circulation within these parts is of three kinds. When they are first formed, currents take place in the interstices, through irregular areolæ; in the next place, insulated vessels are found; and, thirdly, these vessels at last become continuous with those of the neighbouring parts. Andral says that each of these stages may exist in different parts of the same fibrin.

I may mention, that when you open a serous membrane which has been inflamed, you will find upon it points, or stars, or patches of vascular redness. In the first degree of inflammation there are merely points; if there be still more inflammation, there are stars; but if there be a still higher degree, and very numerous vessels contain blood, then you have a diffused redness.

When the part inflamed is either the cellular membrane or the substance of organs, (as, for instance, the liver), the pain is fixed;—not diffused, as in the case of a mucous membrane; but fixed and rather acute, though not so acute as in an inflamed serous membrane. It is rather dull, but rather acute, notwithstanding; and even pul-

sating, or throbbing. There is an effusion of serum into the surrounding parts, and at length suppuration takes place in that spot where the inflammation is most intense; and in the midst of lymph an abscess is formed, such as I have previously mentioned. If any tumor be produced, you find it hard; and, of course, when it suppurates it becomes soft, and the pain remits; though, generally, the tension from the collection of matter, keeps up the pain and the other symptoms. When the matter escapes, the part heals by granulation and cicatrization; as I mentioned when speaking of abscesses.

Inflammation of the substance of the viscera, or of any part of the cellular membrane, forming an abscess, rarely ends in gangrene; except that particular form which is called *carbuncle*. The inflammation of the cellular membrane, or substance of the viscera, is called *phlegmon*. When, however, it is near the surface, and has a tendency to produce gangrene, it loses that name, and we call it *carbuncle*. In carbuncle, the cellular membrane will die to such an extent, that surgical aid is necessary, in order to make a very large opening for its escape.

Inflammation of the cellular membrane and of the viscera, is sometimes not insulated, but diffused; and, as I mentioned when speaking of the skin, this is frequently called *erysipelas phlegmonoides*,—provided the skin is also inflamed; or *diffused inflammation of the cellular membrane*, if the skin is not inflamed. This inflammation is occasionally chronic. Nothing is more common than for inflammation of a *mucous* membrane to be chronic; but inflammation of a *cellular* membrane is not so frequently chronic, though sometimes it is; and we observe this especially in the lungs and liver; so that people labour under chronic peripneumonia, and more frequently under chronic hepatitis.

With respect to the fibrous membranes, this name is given to fascia, aponeurosis, tendons and their sheaths, ligaments, and periosteum. If these be inflamed, the disease which commonly exists is rheumatism. You may, of course, have inflammation of any of these parts without rheumatism; but if there be a general tendency to inflammation of these throughout the body, it is called rheumatism. Frequently, however, the inflammation of a single one of these parts is the same disease. In rheumatism, although the pain is obtuse, yet there is a feeling of tension; and gelatinous exudations take place, something like synovia. This form of inflammation rarely runs on to suppuration; still more rarely, if ever, to mortification. The pyrexia may be out of all proportion to the violence of the local inflammation; and, indeed, one character of the disease is the occurrence of profuse sweating. In acute rheumatism, you seldom find profuse sweating to be absent, either at one period of the disease or at another. It generally occurs at the commencement of the affection; at any rate, if the patient be kept at all warm, the tendency to it is sure to shew itself; and the sweats are frequently of so marked a character, that you can be at no loss instantly to discover their

nature. They are usually very sour. This variety of inflammation generally terminates in resolution, or degenerates into the chronic form;—perhaps with a chronic collection of gelatinous matter about the joints, and in the thecæ of tendons.

The peculiarity of this inflammation is, its great tendency to wander;—to *migrate*, as it is said; so that you shall have it now in one joint, and in a few hours in another. Occasionally it is metastatic. It will cease in these particular parts, and inflammation of an internal part will begin;—generally an inflammation of some membrane, either the arachnoid, I believe, or the dura mater;—we cannot say exactly which; but, certainly, more frequently than not, it is the pleura or the pericardium;—the latter, however, more frequently than any other. But it is not by metastasis only, that this internal inflammation takes place; for you will continually see inflammation of the pericardium, or of the pleura, occur in rheumatism, while the affection is going on in the joints, just as violently as before; and frequently this internal inflammation does not take place, till after the rheumatism has been over some time. When the pericardium, for example, has been inflamed, if the person do not die, the pericarditis has a great tendency to become chronic. Disease of the heart is then set up; the substance of the heart itself frequently becomes thickened, or hardened, or softened; the internal membrane of the heart, chiefly about the valves, becomes affected; and you have all the symptoms of a diseased heart. You have organic disease of the heart established. This is by far the most common origin of diseased heart in young persons. Pericarditis is first set up; and this pericarditis is generally connected with rheumatism.

Such are the chief varieties of inflammation occasioned by *structure*. The *sympathies* of the particular part affected, likewise occasion varieties in the general symptoms. You have some symptoms from the sympathies of the *general* structure affected. For example,—if the structure affected be a *serous* membrane, from its sympathies you have a peculiar pulse;—in general, a hard pulse. From another sympathy, when *fibrous* membranes are affected, you have a particular sweating. But, besides these general sympathetic effects,—these effects from a particular structure, you have peculiar sympathetic effects from the *organ* itself, to say nothing of its structure. If the stomach or intestines be inflamed, you have generally a sensation of great weakness and a wiry pulse; but this does not occur as the consequence of an inflammation of the peritoneal coat of the intestines, or any other of their coats;—for then it would take place when a similar structure was inflamed in other parts; but it occurs because the organ affected is the *intestines* or *stomach*. When the kidney is inflamed, you have vomiting, a retraction of the testis of the same side, and various other symptoms; simply because the *kidney* is inflamed. Hence you have a certain set of symptoms in inflammation, from the peculiar sympathy of other organs with the part affected.

There are other varieties also observed. Erysipelas of the head has a great tendency to run to the brain. One can hardly say this is metastasis; because the inflammation frequently still continues violent in the face itself, even after the symptoms of phrenitis come on. Inflammation of the parotid glands, of that peculiar kind said to be contagious, called *mumps*, has a great disposition to occasion sympathetic inflammation of the brain or of the testes. Indeed, when any organ is inflamed, and the inflammation continues any length of time, it is not uncommon for another and a distant organ to become inflamed likewise. This organ is generally either the brain, the lungs, or the alimentary canal;—sometimes, however, (though less frequently) the skin, and sometimes the throat. When a part has been once inflamed, it has a great tendency to fall into inflammation again, from slight causes. You certainly have inflammation of an organ, from sympathy with the particular organ affected; and very frequently when this second inflammation occurs, although it may be very slight, it is attended with very considerable ill effects. The constitution is so much impaired by the first inflammation, that the addition of disease, though slight, in another organ, produces very great danger, and frequently death.

Inflammation is sometimes intermittent, and sometimes absolutely periodical. Inflammation of the eye has been observed to recur at particular periods. It has frequently been observed to be intermittent,—to come on violently every evening, or every other evening, at a certain hour. I have also seen periodical catarrh.

You will have variations of inflammation, according as the constitution is healthy or unhealthy. If the constitution be healthy, the inflammation is more active,—is more rapid; and the terminations, when they occur, are more perfect. When the constitution is in an unhealthy state, the parts inflamed are feeble. There is less activity in the inflammation,—less brightness of colour. The terminations which take place are less perfect; and the secretions of the part are more unhealthy.

You have still farther varieties in the symptoms of inflammation, according to the cause which has produced it; and the inflammation on this account is frequently termed *specific*. For example,—inflammation of the skin, as in small-pox, is induced by a specific cause; and therefore it is called a specific inflammation. Independently of its cause, some inflammations run a peculiar course, and are therefore specific. Such is erysipelas.

I have hitherto been considering *active* inflammation; but inflammation is sometimes also said to be *passive*. If in an inflammation there be but little pain; if the redness be dull; if the heat be but slightly increased, perhaps not at all; if there be more than the usual swelling, and a very abundant secretion;—the inflammation is said to be passive. I have already mentioned, that some persons object to this term; and say that such a set of symptoms as these, are not inflammation; and Andral, to avoid the difficulty, calls all inflammations and congestions *hyperemy*;—the excessive presence of

blood in the part. "Active *hyperemy*," is synonymous with "active *inflammation*;" whereas, if the symptoms be those I have just described,—a dingy colour, flaccidity of the parts, and little or no pain,—then, instead of calling it "passive *inflammation*," (which he says is absurd), he calls it "passive *hyperemy*."

The terms "*acute*" and "*chronic*" apply merely to the *duration* of inflammation; and not to the difference as to whether it is active or passive. An *acute* inflammation may be *passive* from the first. When a person is already weak before the attack of inflammation, or the part has been frequently inflamed before, then at the very outset the inflammation may be of a passive character, although acute. After inflammation has continued for a length of time, it may be still active;—the part may still be hot and painful, and this state may yield only to the remedies of active imflammation. Hence "*active*" and "*passive*," with regard to inflammation, (as with respect to all other diseases), are not synonymous terms with "*acute*" and *chronic*."

You will find inflammation sometimes distinguished into *tonic* and *atonic;* and these terms refer, not to the active or passive condition of the part, but to the powers of the system. If the constitution be strong, the inflammation is called *tonic;* whereas, if the system be in a weak state, the inflammation is called *atonic;* because inflammation is sometimes very violent in the part, and yet there is no power in the system. The activity is all of short duration; the powers are exhausted; and perhaps mortification takes place. The activity,—the violence of inflammation in a part,—is more than commensurate with the powers of the system. If the *part* be in a state of activity, the inflammation is called *active;* but if not, it is called *passive;* whereas, the words "*tonic*" and "*atonic*" refer rather to the powers of the system at large.

Inflammation, when it continues, will sometimes cause an enlargement of parts. It will cause them to increase,—to be over-nourished; and then the occurrence is termed *hypertrophy*,—excessive nourishment. On the other hand, it will sometimes cause them to waste,—to be *undernourished*, if I may so speak; and then it is called *atrophy*. It will occasion them to be indurated, or to be softened; and it will give rise to various transformations; so that a part shall become pretty firm cartilage, or even actual bone. These results of inflammation, are sometimes combined in the same part; so that a part shall be both hypertrophied and atrophied. If a part be compounded of different structures, one structure may increase,—become harder, and thicker than before; while another constituent of the same organ shall waste away; and one part shall become indurated, while another shall become softened; so that you may have hypertrophy and atrophy,—induration and softening, in different structures of the same compound organ. For example,—you frequently see a thickening of the *investing membrane* of an organ, and a wasting of the *substance* of the organ itself: and you will sometimes see a thickening of the cellular membrane, while one of the other structures shall

waste away. The retina is sometimes found in a state of atrophy, while other portions of the eye are excessively thick, or indurated to the consistence of cartilage. Acute inflammation more frequently, as I have already said, causes softening than hardening; and wasting rather follows acute inflammation than chronic; except when the chronic form induces such over-nourishment of one constituent part of an organ, that another structure wastes. Generally, however, acute inflammation is disposed to produce softening; and if any other change occur, it is rather that of atrophy. Chronic inflammation, on the other hand, chiefly causes parts to become hard, and hypertrophied,—over-nourished,—thickened; and it is this which causes transformations,—causes parts to become cartilage or bone. I do not mean to say that these will not arise without inflammation; but when they are produced by inflammation, it is usually the chronic and not the acute form which gives rise to them.

Besides, however, these alterations of structure, with regard to size and consistency,—and these changes to a new structure, but still a structure which exists in the body,—you will find parts which have been inflamed acquire a perfectly new character, and form a structure unknown to the healthy body. If the changes of structure be merely to bone, or cartilage,—structures which exist naturally in some parts of the body,—then the formation is called *analogous*;—that is to say, it is analogous to a structure of the body; but if the change of structure produced do not naturally exist in the body, then it is called *non-analogous*. The same occurrence takes place, with respect to the fluids which are poured forth in inflammation. Serum, fibrin, and mucus, which are occasionally poured forth in an increased quantity in inflammation, are analogous to fluids which exist in the body naturally; but that is not the case with pus, and consequently it is non-analogous. You therefore see that, in the case both of the fluids and the solids, the results of inflammation are similar;—the productions may be analogous to those which occur in the body, or they may be non-analogous.

Now it is to be remembered, that these various changes of size (hypertrophy and atrophy),—of consistency (induration and softening);—as also these transformations; the occurrence of hæmorrhage, the occurrence of effusion (dropsy), the occurrence of a discharge from a mucous membrane (a gleet); and perhaps adhesion, ulceration, and mortification;—nay, some say, even suppuration;—may all take place without any inflammation. They are continually the effect of inflammation; but certainly most of them do sometimes occur, without our being able to discover that any inflammation existed. In the case of hemorrhage, though it is frequently the result of an active inflammation, and generally too in a mucous membrane, yet it is often passive; and is poured forth without either pain, heat, swelling, or general irritation;—nay, it is frequently poured forth without any fulness at all, to be discovered in the vessels of the part. I have opened persons who have died from hemorrhage; in whom there was no collection of blood to be found in the parts which

afforded the hemorrhage. While every part of the body, from the head to the foot, was perfectly pale, yet there was hemorrhage from time to time until death ensued; and it must have come from small vessels, because no large vessels could be discovered to be ruptured. Certainly you will have chronic hydro-thorax and ascites, without any inflammation of the serous membrane;—no pleuritis,—no peritonitis. With respect to mucous membranes, you continually see a gleet, without the occurrence of any one symptom of inflammation. It is even thought by some, that suppuration of the lungs will take place without inflammation;—that where a single vomica of mere tubercular matter has been generated, and suppuration has taken place, there has often been no previous inflammation. Whether that is correct, I will not say; but certainly large adhesions continually occur in the pleura, in persons who have no recollection of having been the subjects of inflammation within the chest. Occasionally portions of fibrin are spit up from the bronchial tubes, without a person having, beforehand, suspected the slightest inflammatory state of those parts. Ulceration is thought, by some surgeons, to occur occasionally in the cartilages of joints, without inflammation; and certainly ulceration will now and then take place in the skin and throat, with little or no inflammation. Such ulceration is continually seen in scurvy. Ulcerated, like softened, mucous membranes, are sometimes quite pale. Mortification will occur every day without inflammation. Instances of this are seen in the lungs; and more rarely in other viscera.

When the chief vessel of a part is obstructed by a ligature, this will frequently produce mortification of those parts below, to which the ramifications of the obstructed blood-vessel are distributed. Sometimes the legs will mortify from bad food; and the most common kind which produces this effect, is diseased grain. Spurred rye, or *ergot of rye*, (as it is called), causes mortification, I believe, in all animals; though the quantity requisite for that purpose varies in different species. If an animal live upon it, there is sometimes a reddish fluid observed to ooze from the nostrils; sometimes there is violent pain of the extremities; and sometimes there is also heat and redness,—actual inflammation; and then gangrene takes place. Frequently, however, it does not cause heat and redness, but a withering of the part; which will dry, and look like the extremities of a mummy. The extremities become cold, dry, and shrivelled; and at the same time, diarrhœa, vertigo, convulsions, and delirium, very frequently take place. Internal inflammation is frequently induced in the alimentary canal; but the extremities generally mortify, and look as I have stated. I need not say that this state is not contagious. It is common in France, and formerly it was common in England; and when the latter was the case, the cause appeared to be diseased wheat.

I believe that other grain, diseased in a similar manner, has a similar effect. The ergot of maize in Colombia, is said to act thus;—at least it will cause the hair to fall off,—sometimes the teeth to

drop out; and it frequently induces sudden death. It so happens that brutes are exceedingly fond of it. They will therefore frequently gorge themselves with it, and then die suddenly. It was observed that the hens which ate of it, in Colombia, discharged their eggs prematurely,—before the shell was formed; and it is imagined (at any rate, it is possible) that the fact of its occasioning the abortion of eggs in hens, led persons to employ it in the case of the human subject, for the purpose of emptying the uterus speedily. I may mention that its peculiar properties appear to be destroyed by cold; for it is found, that if this diseased maize be carried over cold mountains,—over the Paramos, it may afterwards be eaten with impunity. So, at least, it is said.

Mortification will sometimes occur, not from inflammation, but from ossification (it is said) of the minute arteries. Some say that mortification will arise from the ossification of the larger and more distant arteries; but certainly it is generally believed to be sometimes occasioned by the ossification of the minute arteries. Cruveilhier, by artificially inducing a similarly obstructed state, produced the same effect. He injected mercury into the arteries, so as to fill the capillary vessels with it; and when an obstruction was thus produced, mortification was the consequence.

It is possible, that, when extreme congestion of blood takes place in parts, and continues for a length of time, it may produce mortification, in some measure, from the blood coagulating in the minute vessels. Nothing is more likely than this.

The mortification which arises from obstruction in the minute vessels, induced by ossification of the minute arteries, most frequently takes place in males; and especially in the old and voluptuous. Generally the gangrene is dry;—the part shrivels up, and this state is preceded by very great pain. There are two varieties of dry gangrene;—the *pale* and the *black*. Some believe that mortification never occurs without inflammation; but I do not think this is proved. Many things are asserted in medicine without, I think, sufficient proof; and occasion a great deal of trouble to those who follow the asserters, by making it necessary for them to prove that the assertions are not true. I do not mean to apply this remark to the case before us; because we have here only an *opinion;* but what I complain of is too common an occurrence. I do not know that it is proved, that mortification is always preceded or accompanied by inflammation; but if it be, still the mortification is often not by any means in proportion to the inflammation. You see the severest mortification, with the slightest inflammation, or none at all; and you see the most intense inflammation, without inducing mortification. Some inflammations have a great tendency to end in mortification. The inflammation of glanders, in the human subject, though not more intense than many other inflammations of the face, nevertheless has a great tendency to induce mortification.

With respect, now, to all the effects of inflammation, and those changes which, though they frequently are its effects, yet sometimes

appear not to be exactly so,—I may mention that induration is generally the result of slow inflammation; but that softening is continually seen without any signs of inflammation at all. Hypertrophy,—over-nourishment,—like induration, is, I believe, generally the result of slow inflammation; but atrophy,—the wasting of a part,—is frequently seen without inflammation. I may mention that in phthisis, the heart is usually small, flabby, and perhaps shrivelled; though not previously inflamed. The transformations of one structure into another structure, natural to the body, though not to the individual part, are certainly more frequently the result of inflammation than not; but the new formations,—those which are not analogous to anything already existing in the body,—are far more frequently not the result of inflammation. It continually happens that there is not a vestige of inflammation to be found during their production. They appear to be alterations of action, rather than the result of an actual inflammation. The part is entirely altered, and a new product is formed; but that is all. It does not appear to be the result of inflammation. When inflammation does accompany those new formations, which are called *non-analogous*, (such as encephaloid disease, or cancer), it is often only an accompaniment, and not their cause. Sometimes it is only the *predisposing* cause. Inflammation throws a part into a predisposition to disease; and then a fresh disease is set up. That these things are not the result, at any rate, of mere inflammation, is shown by the fact, that ten times more inflammation continually occurs, without such effects being induced. If there be inflammation which goes on *pari passu*, still you are not justified in saying that they are the result of inflammation; and in these affections, if you employ the most vigorous antiphlogistic measures, in the most persevering manner, still you do not cure the disease; you scarcely control it, or not at all. The tendency to the morbid process, is continued; and the disposition to it would often appear to excite the inflammation;—that is, the inflammation appears to be the consequence of the disposition to the disease; and not the disposition to be the result of the inflammation. Indeed, inflammation, in many cases, is only the ultimate effect. The new formations irritate the part so much, that inflammation is excited, and an attempt is made by nature to discharge the formation. In this way schirrus has sometimes been completely separated, by nature, from the body.

The existence in the lungs of tubercles (which are new formations,—not analogous to anything in the body) cannot be the result of mere inflammation; because you see inflammation occurring every day without them; and you see them produced without signs of inflammation. Occasionally, people who are disposed to this disease will, by having the lungs thrown into an unhealthy state by inflammation, become the subjects of tubercles from that time; because anything which throws the body out of health, gives a predisposition to disease of some kind or other; or if there be a predisposition, it is increased, and the new disease is excited. If you feed a rabbit

badly, keep it in a damp place, and in the dark, so that it has a deficient quantity of light and heat, together with unwholesome food, it may become the subject of tubercles. A new depraved secretion takes place; but this is not the result of inflammation. If you were to give an animal stimulants, you might produce an inflammatory state of the whole body, or of any organ; but you would not induce tubercles. The attempt to explain every thing by inflammation, certainly appears to me an absurdity; and I am happy to find my opinions on this subject coincide with those of Andral; who (in his "Morbid Anatomy") argues successfully, in opposition to Broussais, that inflammation is not always the cause of tubercles; that it occurs continually without inflammation; and that when it does occur as the consequence of inflammation, it is not so much the result of the inflammation itself, as of the part being thrown out of health, and thus easily becoming the victim of the predisposition to tubercles. These are all the observations that I have thought it necessary to make, respecting the symptoms and effects of inflammation. I shall hereafter speak of changes of structure in general.

I shall now consider the *causes* of inflammation; commencing with the *remote;* and of the remote causes, the *predisposing*, of course, come first to be considered. The first circumstance predisposing to inflammation, is the sanguineous temperament; and the next may be considered high health. In the sanguineous temperament, there is generally a great quantity of blood; at any rate there is a large quantity in the minute vessels; so that the blood—the pure blood itself—circulates to a great extent throughout. The body is readily flushed; vessels, which should not, readily receive blood; and the circulation is full and rapid. I need not say that high health must have the same effect. A person in a high state of health, has a florid colour. There is an increased quantity of blood circulating throughout the body, and to a greater extent than in other temperaments. Besides these two general circumstances of the body, the same occurrence may take place locally. There may be a local sanguineous fulness,—a local fulness of blood; and that may predispose a part to inflammation. The face is certainly more supplied with blood, than any other portion of the surface of the body; and consequently when exanthematic affections (such as measles and small-pox) take place, most of them affect the face, sooner than any other part of the surface; and the inflammation which occurs there is severer. The same thing will occur from a particular period of life. In children the circulation appears most vigorous in the head. What is called "determination of blood to the head," takes place;—all that is meant by which term being, that more blood proportionately is circulating there than in other parts. In youth, the greatest determination is towards the chest; and in the middle period of life and afterwards, it is in the abdomen. Hence children are particularly disposed to hydrocephalus,—to inflammation of the arachnoid membrane of the brain,—to other cerebral affections; and are continually having fits,—continually having affections of the head;

and, consequently, a large number of children die of acute diseases of the head. Hence, too, children are particularly subject to epistaxis. Persons in youth,—those who have passed the period of childhood, are certainly more subject to all affections of the chest,—to all thoracic inflammations, and to inflammatory spitting of blood. It is adults, particularly, who have inflammation of the stomach and intestines, both acute and chronic;—especially chronic inflammation of the stomach and of the liver;—indeed, inflammation, and congestion, and structural changes of all the abdominal organs.

Seasons and climates will operate in the same way, by exciting either general or local fulness. Pulmonary inflammation is more common in cold climates, and likewise in the winter and spring; whereas in hot climates, and in the autumnal season of temperate climates, hepatic inflammation is most common.

Occasionally a part will acquire an increased excitability from a previous injury; and this is remarkably shown in the head. If a person have once had a severe injury of the head, he may afterwards suffer from a slight cause;—a cause which scarcely would have disturbed him before. I saw a person who had had a fracture of the skull; and for many years afterwards he would become completely delirious, on taking a glass of spirits. This is an occurrence, indeed, that I have frequently seen. I very well recollect the case of a man, who laboured under rheumatism of different parts of the body, and among others of the scalp; but he had suffered severe fracture of the skull some years before; and the mere excitement of the external part of the head, was sufficient to excite it internally; so that he had violent delirium from mere trifling rheumatism of the scalp. Previous inflammation from any cause, disposes a part to be inflamed again. Various causes, of an opposite tendency, will also have the same effect. Bad air, copious evacuations, bad food, depression of mind, fatigue of body, fatigue of mind, the frequent exhibition of mercury, an exhausting climate, and previous disease of any kind, will also dispose to inflammation. While all these predisposing causes, however, induce inflammation, its character differs totally according to the nature of the cause. The inflammation induced by the first kind of causes I mentioned, is active and tonic; whereas the inflammation disposed to by bad food, bad air, depression of mind, and so on, is either passive or atonic;—the inflammation itself is of a passive character; or there is not sufficient power in the system to carry it on,—to get the patient well through it, or to produce a healthy secretion of pus, if pus be produced. Hence the character of the inflammation varies, according as the predisposing cause is one which gives strength, high health, and excitement; or one which destroys health and strength, and gives a tendency only to an unhealthy excitement.

Some of these latter causes, such as the defect of heat and of food, act as predisposing causes to inflammation, without producing any debility, or any atonic character of the inflammation. If a part be exposed to cold, it becomes more affected afterwards by a given

degree of heat. If a person be deprived of food, then, when a small quantity of food is given him, (though of the weakest character), it will produce an excitement which only strong food and a large quantity would have produced before; and therefore some of these predisposing causes,—a defect of heat and a defect of food,—may act also by rendering the part more liable to be affected by stimulants; for stimulants act according to circumstances that went before them. According to the first, so is the second; and all that is requisite is, for there to be a great disproportion between the two. It is no matter whether the first is very defective, or the second is very great; for the effect is in proportion to their *relative* intensity; and therefore parts that have been exposed to cold, become violently inflamed if exposed to a moderate heat; and a person who has been nearly starved previously, has been known to become delirious, merely on taking a little veal broth. Many of these causes, however, produce a cachectic state of the constitution; and then inflammation, if it occur, is of a corresponding character.

With respect to the exciting causes, we may mention, in the first place, a local stimulus; be that stimulus mechanical, or chemical, or what is *properly* called a stimulus;—a stimulus independent of mechanical or chemical qualities; such as alcohol. The effect of all stimuli (as I have just now said) is not dependent upon their positive degree of force; but upon the difference between these stimuli, and the strength of those which preceded them. Every body knows the danger of going from cold to intense heat.

Besides local stimuli, (whether mechanical, chemical, or true stimulants), the depression of stimulation in one part, will cause an inflammation in another. From having the excitement in the feet exceedingly depressed, by a person getting wet through, and sitting with wet shoes, there will be such increased activity at a distant part, that inflammation may occur; so that many persons always have a sore throat, or inflammation of the chest or eyes, if they get wet through, or have wet feet. This application of cold,—depressing the action of one part, and thus producing an excitement in another,—depends very much for its effect upon the previous excitement. If the feet, for example, have been already hot;—if they have been heated, and are in a state of perspiration,—then the application of cold produces so great a depression, that the inflammation of the throat, for example, or the lungs, will be so much the greater. Cold, within certain limits, is found to be more injurious in producing distant inflammation, the more partially it is applied; but cold will itself, I believe, directly induce inflammation, exactly as great heat will do. When we are exposed to cold air,—when exceedingly cold air is passing through the nostrils, the nose will "run;" and it has been found experimentally that cold will really induce the same appearances, in the minute vessels, as heat, and absolute stimuli. Nothing is more common than for rheumatism to be felt in the shoulders, or for an inflammatory pain to be felt in the ear, when cold air is blowing upon these parts.

Thus, it appears, I think, that cold may induce inflammation in three ways:—in the first place, by rendering the body liable to be very much excited by the stimuli that come afterwards;—by depressing the action so much, that when the stimulus of increased temperature is applied, the effect of this is tenfold increased. In the second place, it would appear to act by depressing the action in one part, and thus exciting a correspondent excess of action in another; and thirdly, it appears sometimes to act immediately and directly, by exciting inflammation. I think we have instances of all this. First, when a person goes from the cold into a warm room, you will see his face become very red,—become exceedingly hot; and frequently he will cough violently, and a catarrh will be set up. In the next place, we see persons have inflammation of the eyes, nose, mouth, throat, or chest, from their feet getting wet and cold; and thirdly, we continually see pain in the ear, rheumatism of the shoulders, and the nose "running," when cold air is applied to these very parts.

I believe that sudden refrigeration, and the sudden application of cold after excitement, are more frequent causes of inflammation, than the application of heat after cold. The greater number of cases of inflammation that we meet with, are instances where persons have become suddenly cool, when they were over-heated and fatigued. Perhaps they have got wet, as well as suffered the application of merely cold air. A rigor is frequently induced; and a state arises which is soon followed by inflammation. The effect of sudden refrigeration, therefore, is greater in proportion to the previous excitement; it is also greater if it be partial than if it be general; and it is always greatest if there be much sweating and exhaustion. Sometimes, indeed, fatal results have instantly occurred. Many persons, from taking ice when they have not only been hot, but sweating and exhausted, have dropped down dead. The account of Alexander the Great bathing in the Cydnus, when exceedingly hot and exhausted, after great fatigue, is well known: he nearly lost his life by it. How hot so ever the body may be, there is comparatively little danger, if it be not fatigued. The Russians go from the vapour bath to the snow, and roll in it.

The effect of cold applied to the body, is much increased by damp. Very often persons do not suffer from the application of cold, till dampness is conjoined with it. It may act simply by increasing the cold,—by lowering the temperature still more; but I cannot help thinking that it injures, to a greater extent than this will explain;—that it is injurious out of proportion to the greater diminution of temperature, which the dampness occasions. Many persons are not so strong, by any means, in damp weather. It is possible that it may act by conveying the electricity away in too great a quantity. In dry weather we are all active and vigorous; but in damp weather there certainly is a degree of languor,—an inaptitude for action, both of body and of mind, which most persons notice.

The effect of cold upon the body, is much increased by sleep.

In sleep the powers of the body are less; the pulse is slower; the heat is not so high; and all noxious agents are less withstood. It is a common remark, that if a person go to sleep in a draft, he is sure to catch cold; whereas, if he contrive to keep awake, he is very likely to escape. At any rate, every body knows that if a person fall asleep, when exposed to cold, he is almost sure to suffer. Cold, too, appears to be more dangerous when applied to the back part of the body, than to the front. I imagine there is less power there than in the front. Persons will escape if a little draft come in the face; whereas, if it come to the back of the head or neck, they almost always experience ill effects.

Inflammation is sometimes excited as a *sympathetic* occurrence. But when I say that inflammation is excited by sympathy, I do not *explain* the fact; I merely *express* the fact. When one eye is inflamed, the other, without any external cause, may also become inflamed; and this is called a sympathetic result; it is said to occur by sympathy. It is common, if the head be inflamed in a child, for the abdomen to become likewise inflamed,—either the intestines, stomach, or liver; and *vice versâ*. It is of the highest importance, in practice, to be looking out for this circumstance; or you may be treating only one inflammation, when two exist. If asked the nature of a case of this description, you will be fully justified in saying that is complicated;—that there is inflammation in two parts, though you told the friends with truth at first, that there was inflammation of only one.

Metastasis is also another mode in which inflammation occurs. When inflammation of the parotid glands (in mumps) ceases, the brain will become inflamed; or (what is more common) the testicles, or one testicle; and this inflammation, I may mention, often affords an illustration of atrophy, as the result of inflammation. It is very common, indeed, for a testicle, when it has been inflamed after mumps, to waste away; so that nothing will be left but the membranes. In gout, metastatic inflammation continually occurs. When the gout ceases in an extremity suddenly, it is very common for inflammation, of an apoplectic nature, to take place in the head; or for inflammation to occur in the stomach or intestines.

Occasionally we have inflammation induced, from the introduction into the circulation of unhealthy or acrid matter. If pus, or any other diseased secretion, be absorbed, it is very common to find a deposition of it, at a distance from the part in which it was originally formed. We have a deposition of pus, or of lymph, at a distance;—in the various viscera, in the cellular membrane, or even in the secreting cavities; or we have inflammation and disorganization without deposition. Probably inflammation of the veins takes place; and perhaps the pus formed in them causes such an inflammation in distant parts, that new pus, lymph, and other things, are there produced. But such is the fact, that if pus, or an acrid secretion, get into the circulation, these results take place; if not distant inflam-

mation, at any rate a deposition of pus,—or lymph, debility, great irritation, and a sallow hue of the countenance.

It has been said, that the *predisposing* causes to disease will sometimes become *exciting*,—merely by their continuance and increase; so that no exciting cause (properly so called) is necessary. This may be the case with regard to fulness of blood. A part may become more and more filled with blood; congestion or determination of blood (whichever it is called) may increase, till at last inflammation occurs; or if it be the head that is affected, a state of apoplexy may be produced, without any actual exciting cause. However, in specific inflammation this cannot be the case. I suppose that all the predisposition in the world would not give a person the small-pox, unless the exciting cause were applied.

Such are the observations which I have thought it necessary to make, respecting the *remote* causes of inflammation. We will now consider the *proximate* cause;—that which is essential to the existence of the disease;—in fact, the actual state of the parts in inflammation. In the first place, I think it is a fact that, in inflammation, blood is found in vessels which are not designed to contain it; blood enters vessels which, in a healthy state, contain no blood; and, in the next place, those vessels which naturally contain blood are enlarged, and contain more blood than they ought to do. John Hunter made an experiment to prove the latter circumstance. He says,—"I froze the ear of a rabbit, and thawed it again. This excited considerable inflammation, increased heat, and considerable thickening of the part. This rabbit was killed when the ear was in the height of inflammation; and the head being injected, the two ears were removed and dried. The uninflamed ear dried clear and transparent; and the vessels were seen distinctly ramifying through the substance; but the inflamed ear dried thicker and more opake; and its *arteries were considerably larger*."

That blood-vessels have undoubtedly a contractile power, is shewn both in the large vessels and in the capillaries. I do not know how the action of the capillaries, or of the arteries, can *contribute* to the circulation in health; but it may *alter* the circulation, according to the larger or smaller size of the vessels,—accordingly as they are constricted or dilated; so that there may be more or less blood in the part itself, and in those parts to which these vessels lead. The whole of our present knowledge upon this subject, together with my own opinions upon it, you will find (like the circumstances attending the coagulation of blood) in a note upon the "Motion of the Blood," in Blumenbach's "Physiology."* I will not, therefore, dwell upon it. But although it is quite certain that the arteries and capillaries have this power of contraction; and although I doubt whether it can assist in *furthering* the circulation, (though it certainly may, and certainly does *alter* it every day), I cannot conceive that this increased action is compatible with increased redness and

* Dr. Elliotson's Translation. See Appendix, No. III.

fulness. I cannot conceive that, in inflammation, when a part is redder and fuller than it should be, there can be increased action;—by which I mean, that the vessels can be at once more constricted and more dilated, than before; for if they were redder at the one moment, they would be paler at the other;—the one would counterbalance the other. But whether there is increased action or not, it would appear, at least, that there is a diminished motion of the blood, in inflamed vessels. There appears to be a retardation of the motion; and such retardation is commensurate with the inflammation. This has been shewn by Vacca, Lubbock, Bichat, Allen, Dr. Wilson Philip, and recently, under the microscope, by Dr. Hastings. Still more recently, Gendrin has confirmed the observations which were made by Drs. Philip, Hastings, and others. They applied mechanical violence, heat, cold, and ammonia; and they perceived, by the microscope, that at first the blood moved more rapidly. There was an increased velocity; and a contraction of the vessels was seen, inducing paleness. This is what we should expect from what is called "increased action." After the increased action,—after the contraction of the vessels, the motion became slower; the course of the blood was retarded; the vessels became dilated; and inflammation appeared. In this they all agreed. If the part were already inflamed, and then a stimulus was applied, this stimulus had the immediate effect of quickening the blood's motion, and constricting the vessels; and then the inflammation ceased. If the stimulus were applied very violently, so as to produce most violent action, and extreme rapidity, of course this lasted a shorter time; and the second stage,—that of slow motion, dilitation of the vessels, and inflammation,—came on sooner. By applying the stimulus very violently, the second stage might be made to come on immediately. It is said, however, by them, that the oil of turpentine differed from all other stimuli, by causing the first stage only;—it was not followed by the second; and if it was applied in the second stage, it always removed it; while common salt, on the contrary, caused instant dilatation,—caused instantly the second stage. It would appear from these experimenters,—who are very numerous, reside in different countries, have succeeded each other, and have each repeated the experiments with a view to ascertain whether his predecessors were correct or not,—it appears from them that, in an inflamed part, the blood moves more slowly; that the vessels are dilated; and that, by applying stimuli, you cause the vessels to contract, and the blood to move more rapidly; and that then the inflammation ceases for a time, till the blood is retarded again, and the vessels dilate. One would not expect that cold would have exactly the same effect as stimuli; but such was found to be the case. We all know that, if parts are cold, they become reddish; as is seen in the nose and cheeks in winter. They grow dark,—more and more red; till at last they become of a mulberry-colour; and congestion sometimes takes place to such an extent, that gangrene occurs.

You will find very excellent information on this subject, in Dr. Hastings's work on "Bronchitis." In the introduction to that work, he treats this subject very fully; and since he published, Gendrin, on the Continent, has repeated the experiments, with precisely the same results.

You will find some objections to these results,—from experiments made by himself,—in Dr. Thomson's work on "Inflammation." By the way, that is a work which every person should read; and not only read, but study carefully. I think it is a much better book to read, on the subject of inflammation, than John Hunter's. But the objections he starts, are fully answered by Dr. Hastings. Dr. Thomson says that you have, in inflammation, increased action and motion; but Dr. Hastings answers, that Dr. Thompson himself, in some cases of inflammation, saw a slower motion; and that he speaks of seeing red globules in the parts where the blood was in rapid motion, and must have made a mistake; because in the blood of parts inflamed, you will not discover red globules at all; for they are mingled together or broken down. Dr. Hastings concludes, therefore, that in the cases in which Dr. Thomson saw rapid motion, there could not be inflammation; but that he saw the state which *precedes* inflammation.

The large vessels going to an inflamed part, are frequently felt to throb. If there be a whitlow upon the finger, the digital artery behind it throbs violently; and in inflammation of the face, the angular artery may be felt doing the same. In the case of headache, the temporal artery is in a similar condition. This, however, is no proof of increased action in them; for the same occurs in an aneurism, or a dilated artery. When an artery is dilated (though weakened), softened, and unable to act as it did before, you will find it throb violently;—simply on account, I presume, of its increased capacity. However, in that kind of inflammation which is called *passive*, and which some say is not real inflammation, but mere congestion, this enlargement of the surrounding vessels is wanting; so that you have not this throbbing of the large vessels.

These appear to be the chief facts ascertained, regarding the state of parts in inflammation; but there are many other particulars. In the height of inflammation, the open extremities of vessels certainly are affected with spasm. They will not pour forth fluid as they did before. When a mucous membrane is inflamed, its secretion will stop. The secretions of a part, at the height of inflammation, cease, or at least are greatly diminished; so that one must suppose that there is a spasmodic and constricted state. Perhaps the word "*spasmodic*" may be objectionable; but a constricted state of the extremities of secreting vessels, appears to exist in inflammation. Far more changes than these, however, take place. The blood is buffed and cupped; it contains more fibrin; and this fibrin is thinner than it ought to be. The blood, in the small vessels, becomes homogeneous,—broken down; the red particles are indistinct; and sometimes flocculi are seen in it, which are not visible in the immediate

surrounding capillaries. When a part is mortified, the blood around it is yellow; its various constituents separate; and it is evidently in a state of disease.

With respect to the symptoms of inflammation, the *redness* is very easily explained, from the existence of blood in vessels that ought not to contain it, and the existence of too much in those which *should* contain it. The *swelling* will arise from the same circumstance; and also from the increased secretion that is going on around. The *pain* will arise from fulness, and from the tension of all the parts. This is produced by the accumulation of blood; and by the excessive secretion around. But the pain will also arise, probably, from an increased degree of sensibility. There is, in every case, pain from fulness and tension; but the pain is felt far more severely, on account of the morbid sensibility. With respect to the *heat*, I presume it arises from the increased momentum of blood in the part;—the increased quantity which is circulating there. If the same quantity of blood were in the part, and motionless, of course the part would grow cold; but as the blood which is in it is far greater than usual, and still moves on so as to come round to the lungs, a greater number of changes giving rise to heat must take place. There is far more blood in the part than there should be; and as heat appears to be connected with the existence of blood which is circulating,—coming round to the lungs and undergoing chemical changes,—in proportion to the quantity of blood circulating, there must be increased temperature. If the blood ceases to circulate, or the circulation becomes languid, so that it does not undergo a regular chemical change, then of course the part becomes cold. Momentum is composed of rapidity and quantity. The rapidity is lessened, but the quantity is greatly increased; so that, on the whole, the momentum is greatly augmented.

The *diagnosis* of inflammation, when the inflamed part is visible during life, or when we make an examination after death, I have already spoken of sufficiently; but if it happen that we have to make a diagnosis, during life, respecting a part which we cannot see, then of course it must be founded upon something else than if the inflammation were visible.

When an invisible part is inflamed, there is almost always pain increased upon *sudden* pressure,—frequently upon the most *gradual* pressure; and there is generally more or less pyrexia or feverishness, or (as some call it) *symptomatic* fever. The pain is often throbbing; and frequently there is a sense of weight and tension. It is, however, to be remembered, that although a part be inflamed, *gradual* pressure may sometimes be borne; and that, on the other hand, very *slight* pressure,—a mere brush of the surface, may cause pain, when there is *no* inflammation. In neuralgia,—when a person is labouring under *tic douloureux*, for instance,—you may sometimes produce the most agonizing pain, by brushing the surface in the slightest possible manner. But that is not the case where there is inflammation. Such a slight touch does not produce such an intense

effect; and, more than that, if a slight touch do produce so great an effect, it is only in inflammation of the skin; and that you can see.

Suppose you are in doubt, notwithstanding the pain is increased by pressure, and that there is pyrexia, the best way always is, if the patient's powers will allow it, to treat it as an inflammation; and you will frequently find that the blood which is drawn away, fully justifies your presumption. You will frequently find that the blood is buffed or cupped, or both; but still, if it be not, and you have strong reason to treat the case as inflammation, you must not suppose that you have less reason to imagine yourself right, *simply* because the blood is not buffed. Generally, however, it will be found buffy, if there is inflammation.

With regard to the *prognosis* of inflammation, you are to consider, on the one hand, the age of the patient, and the evident powers of his constitution; and on the other, the violence of the disease, the degree of disposition to it, and its seat. The danger of the affection depends, on the one hand, on the power which the patient has, from the beginning, of going through it. Much must depend upon his age, and upon the general state of his constitution; and much depends, on the other hand, not only on the intensity of the disease, and its liability to increase, but on its seat. An inflammation, exceedingly violent, in an extremity, might not be half so dangerous as one, less violent, in certain viscera. You are also to calculate upon any idiosyncracy, whether natural or acquired, in the individual. For example, (I believe I have already mentioned the circumstance), I once had a patient, who had merely a rheumatic affection of the external part of the head; but he had previously had his skull fractured; and the irritation without the head, produced sufficient irritation within, for violent delirium to ensue; so that he was in a most violent state of phrenzy. There was no danger at all in this;—it gave way to the ordinary treatment of rheumatism of the external part of the head; but had there not been this idiosyncracy, one would have feared that an inflammation of the brain, of a highly dangerous character, was set up. If the man took a glass of spirits, the same effect, I understand, was always produced. You therefore have to consider whether there is any idiosyncracy or not; for frequently when you are attending a patient for an inflammatory or any other complaint, if he be nervous, you have such a depression of the system, such a quickness of the pulse, such a disturbance of the constitution, as would frighten you if you had not known the patient before.

I now proceed to consider the *treatment* of inflammation; and, first of all, of that which is of an active character.

In the treatment of active inflammation, the first point is to lessen the ordinary stimuli to which the body is subjected, both externally and internally. Excessive action is going on, or there is excessive activity and excitement; and our business is to lessen all the stimuli which maintain that activity. The *external* stimuli may be diminished by exclusion. In the first place you exclude high tempera-

ture;—you procure a moderate temperature, so that its stimulus may act as little as possible. In attending to this point, however, great care must be taken not to allow the temperature to fall too low; for if you chill a patient labouring under inflammation, you not only cause great discomfort, but you most likely increase the affection. By diminishing the circulation in healthy parts too much, it is possible that you may increase the activity of those which are inflamed; so that in lessening the temperature around a patient, it is necessary to diminish it only so far as is comfortable to him.

However, with respect to the part itself, the temperature there is of course too high; and to that part you may apply cold. Cold may be applied by means of plain water; which generally answers as well as anything that can be used, if it be continually renewed; but we can procure, of course, a lower degree of cold, if we employ evaporating fluids,—those which evaporate more quickly than water. It is often of great use to employ real ice; and for this purpose a bladder may be half-filled with it, and laid on the head after it has been shaved, or on the front of the chest, or on any other part of the surface that requires it. If you *fill* the bladder, it will not accommodate itself well to the part; but if it be only *half*-filled, it presses down in close apposition with it. If it be the surface itself which is inflamed, and not the interior of the head or chest, it is not well to apply ice in this way; because the pressure would do harm. Indeed, in inflammation of the chest, cold is not applied externally; it is only in cases of hæmorrhage that we have recourse to it. If the surface, then, be inflamed, it is best to apply plain water, or iced water, or evaporating lotions; but in the case of internal inflammation of the head, or hæmorrhage from the lungs, a bladder half-filled with ice, is one of the best things that can be resorted to. In hæmoptysis, of a decidedly inflammatory character, I have never seen the application of ice attended with harm. Some have said that the application of cold, in the case of inflammation within the abdomen, has been of use; but I am not aware that that is the case. Certain inflammatory pains of the head have given way to a stream of cold water applied to it, when nothing else would succeed. By means of a tube, a stream of water has been applied to the head, for many hours in the course of a day; and the complaint has been thus cured, when evaporating lotions did not answer the purpose.

When the surface is abraded, or when it is a mucous membrane that is inflamed,—such as the interior of the mouth, or the conjunctiva of the eyes, (which is very similar to a mucous membrane),—it is generally found of great service to combine, with the cold water, a small portion of the superacetate of lead; but not sufficient to irritate the part. When the surface, however, is not abraded, I doubt whether the employment of lead is more efficacious, than that of plain cold water, or an evaporating lotion.

The very opposite treatment, however, is often equally beneficial. If you apply warmth and moisture together, you often produce as good an effect as if you apply cold. It is only a speculation; but I

imagine that the reason why two such opposite agents produce the same effect, is this:—If you apply cold, you lessen the stimulus; you lessen the heat of the part; you lessen the quantity of blood in all the vessels; and you therefore lessen the tension; whereas, if you apply warmth and moisture, you cause a relaxation of the inflamed part;—you soften the solids, and in that way the tension is taken off. I presume the cold lessens the stretching cause; whereas the moisture allows the part to be easily stretched,—to give way to the distending fluids. Perhaps the warmth and the moisture applied to the surface, may relax the ends of the vessels, cause a free perspiration, and in that way ease the parts. Such, however, is the fact;—that one patient will be as much relieved by warm applications, as another will by cold. I have myself frequently suffered violent external inflammations; and one part of the day I have found the greatest relief from iced water, or from a stream of cold water constantly applied: and when that ceased to produce ease, or caused pain, then I have experienced the greatest comfort from the application of warm water and flannels. You will find the feelings of the patient to be the best guide, in the application of these means. I never apply cold when it is uncomfortable. If you once allow the patient to become uncomfortable, you may not only produce general chilliness, but make him ill, and frequently increase the inflammation.

The temperature of the part, however, is not the only thing to be attended to. If you know that the part affected is one greatly influenced by other surrounding stimuli, (as, for example, the head), you should likewise exclude light and noise; and should, in all such cases, prevent conversation,—both of the patient and of others; so that you may keep him as free from stimuli as possible. The exclusion of light is an important point to be attended to, in all affections of the head, and particularly of the brain.

Still pursuing the plan of exclusion, you should give the patient but little food; and even that should be of the most inert kind. In fact, you should starve him without letting him know it;—pursue starvation in disguise. Plain water would be the best thing, in many inflammatory complaints; but you must allow toast and water, or barley-water; otherwise the patient would think you were going to kill him. The object, however, is to give as little food as possible; and that of the least nutritious and least stimulating kind. In consequence of the thirst, a great deal of drink must be taken. This should be cold, unless the patient wish to have it warm; and if the drinks be made acid, they are of course so much the pleasanter. A saline draught is a good thing; but a few ounces will be productive of little benefit. The patient should have a pint, in the course of twenty-four hours, if he has it to do him good.

But although these things are all highly important, the great remedy in this disease, is the loss of blood. That is,—you have not only to *exclude* the *external*, but to *remove* the *internal* stimuli; and the great internal stimulus of the body, is the blood. Blood-letting may be performed any where. The object is to withdraw blood;

and not merely so, but to make as great an impression upon the system, by a given loss of blood, as possible. Hence it is generally good practice to make a large orifice in the vein, (if you open a vein); and to make the patient sit up;—so that he may faint quickly. If the blood be drawn with great rapidity, a far greater effect is produced, than if it be drawn slowly. A large orifice tends to accomplish that object; and if a patient be sitting up, he is far more likely to faint, than if he be lying down. When we are sitting up or standing, the blood finds more difficulty in returning to the heart, and escapes more easily from it; and therefore, if there be causes tending to produce fainting, they are far more likely to occasion it in that posture, than if we are recumbent. If it be an object to spare blood very much, and yet make as great an impression as possible, it is well to have two veins opened at once,—one in each arm; and to make the patient stand up. The loss of a very few ounces will then produce fainting.

The rule for taking away blood, in general, is not to consider the quantity, but to consider the effect;—to do every thing you can, to occasion a great effect from a given quantity; but while you are doing so, to go on till the pulse sinks, till the patient says he is better, or till an evident improvement takes place. In any of these circumstances, it is well to stop the bleeding, especially if the patient grow faint; lest the depression become too violent. If, however, the faintness go off, and yet the pulse is no better; or if the patient feels no better; or if, when he has not fainted, but there has been an improvement of the pulse, the pulse falls back into its former state; or if there have been no faintness,—no improvement of the pulse, but a great improvement in the patient's feelings,—a great diminution of the disease, and yet the pain all returns;—then, in any of these circumstances, you should let the blood flow again. In general, one never orders a particular quantity of blood to be taken away, in an acute disease; but rather a certain effect to be produced, if possible.

You sometimes find, on bleeding, that the pulse, so far from diminishing, will increase in volume; and so far from becoming slower, will become quicker; and will still retain its firmness. This circumstance may be a very great improvement. There are some diseases in which the pulse is oppressed;—in which the pulse may be large and firm enough, but seems to have scarcely any activity in it. It is not a fluttering pulse; but it moves heavily, if I may so speak. In what is commonly called an *oppressed* pulse, there is plenty of volume,—plenty of firmness; but very little impetus. This is often the case in affections of the head. The pulse is frequently, at the same time, very slow; but is not necessarily so. A pulse may be oppressed, and yet not slow; or there may be a morbid slowness, and yet the pulse may not be oppressed. The one or the other may be the case; and yet, on bleeding, the pulse will rise. It will be sharper or quicker, or both; and this is as much to be considered an improvement, as diminished force and frequency in other instances;

and I would arrest the flow of blood in both cases. I would then wait and see whether things fell back; and if they did,—that is to say, if the pulse became slower, or heavier, but still having sufficient volume,—I would let the blood flow again.

The repetition of bleeding, after an interval of some hours, or of a day, must depend upon the same circumstances. When the pulse becomes quicker or fuller again, or the symptoms become worse, then you should follow the same rules in repeating blood-letting, as you did at the very moment you were bleeding. In violent inflammation there is, in general, more difficulty in making a patient faint, than when the inflammation is less violent, or when there is very little the matter with the patient. I believe it is true that very frequently, in inflammation, a degree of bleeding will not occasion fainting, which in health, or in a state not far from it, would produce syncope.

But although these are the general rules to be observed, it may be necessary to act in the very opposite manner. If a patient be very plethoric, so that it appears necessary to take a large quantity of blood; if it appear that, without copious depletion, you will only knock down the disease for a minute, or an hour or so; and that all the symptoms may return, on account of the great fulness of the system; or if it so happen that the patient is nervous, and thus easily disposed to faint;—in either of these cases, it may be a great point to prevent syncope, before you have withdrawn the quantity of blood you wish; and therefore it may be right to bleed from a moderate orifice, instead of a large one; and to make the patient lie down, instead of sitting up; and if the patient be very nervous, (as is often the case with women), and likely to faint as soon as a few ounces of blood come away,—before you have taken what is sufficient to make an impression upon the disease, then a smelling bottle may be used. If you expect nervous fainting, instead of syncope from the absolute loss of blood;—if it is likely to arise more from emotion of mind, than from the abstraction of blood, you must make a very small orifice; and more than that, you must make the patient lie down; so that you may be able to carry the depletion far enough to make an impression on the system. If fainting occur when you have only taken away one or two ounces, then you are disappointed. You are obliged to cup, or apply leeches, and go fiddle-faddling on for a number of days, when you might have cured the patient in twenty-four hours; and therefore, in cases where it is requisite to prevent syncope, the use of the smelling bottle is proper, as well as a small orifice, and the recumbent posture; whereas, in other cases, all this would be highly improper. When a patient does faint in ordinary bleeding, I need not say that you must not only stop the blood, but lay him down, lest the fainting should become excessive.

Now, though a quick, full, firm, wiry, or jerking pulse, with the symptoms of inflammation, may justify bleeding; yet the absence of any of these states of the pulse, will not forbid bleeding, if the symptoms themselves demand it. If there be no extraordinary

debility of the pulse,—no feebleness of the constitution; if there be neither tender years, nor extreme old age;—if none of these circumstances forbid free bleeding, you may have recourse to it, notwithstanding that the pulse gives you no such indication. The pulse may not *indicate* bleeding; but still it may *justify* bleeding. The pulse (as we have already noticed) has been called by Celsus *res fallacissima*,—the most fallacious of all symptoms; and, if you depend on the pulse alone, you will be led into error. The pulse will give you highly important information; but if there be a sufficiency of other symptoms to point out the nature of the case,—to show that the person is labouring under an inflammatory affection, though the pulse would not lead you to such a conclusion, you must treat the case in *spite* of the pulse;—provided, however, the pulse does not indicate such debility, as would evidently make bleeding improper; or that the constitution and age of the patient do not forbid it. I have known, in the most dangerous cases of peritonitis,—when the patient was obliged to lie upon his back, with his body and even his thighs raised, so as to relax the peritoneum as much as possible; and where the abdomen could scarcely bear the pressure of the bed-clothes;—I have known the pulse scarcely different in volume, or force, from what it was in a state of health. Notwithstanding that the peritoneum is a serous membrane, I have seen the pulse without any great firmness, any wiryness, any jerking state;—without any thing that would lead you to suppose there was disease of this investing membrane. You will continually see females, in a state of pregnancy, with a small pulse;—such as would prevent you from thinking of bleeding, unless there were other symptoms; but from pressing the part affected, you find bleeding indicated; and from attending to the countenance, and looking at the patient, you see that bleeding will be borne. In the cases of peritonitis to which I have just referred, I have seen the blood, after it has been taken away, both buffed and cupped; and the patient has speedily recovered after a loss, perhaps, of forty, fifty, or even sixty ounces. But it is the same with every other symptom. You are to take all the symptoms together, and seldom place your reliance on one alone. Every one is important in itself; but every one has also its *relative* value.

General bleeding is superior to local bleeding. It is speedy, and it is powerful. However local the inflammation,—however remote from the heart, (even in inflammation of the testicle, or of the finger in paronychia, or whitlow), you will find venesection more powerful, and far more quickly productive of an impression upon the disease, than any local bleeding.

I believe that, in affections of the head, venesection in the arm is just as good as arteriotomy. The great point in an acute disease, is simply to get a large quantity of blood from the system in as short a time as possible; and venesection in the arm will generally answer every purpose. At least I have never seen any thing to

make me prefer opening an artery, in a case of inflammation of the head, or inflammation of the eyes.

If a vein cannot be opened, then I would certainly (in any case of dreadfully violent inflammation) open an artery. I suppose it is always safe to open the temporal artery. If you cannot obtain blood from a vein, in a *very* dangerous complaint, instead of troubling the patient with cupping or leeches, I would open the temporal artery. I know that some practitioners have opened the radial artery. But opening the temporal artery is safe; and generally affords as much blood as is required.

I have never myself had occasion to take away more than thirty ounces of blood at a time; except in one instance, in which forty were required to induce syncope; nor do I recollect having occasion to take away more than eighty ounces altogether, in an acute complaint. Of course, I have taken away many hundreds of ounces in *chronic* complaints;—going on with small bleedings for many weeks, or months; but, in very *acute* complaints, I do not recollect taking away more than I have stated. It is right, however, for you to know, that some practitioners have taken away an immense quantity of blood, in acute diseases, in a very short time; and with success. You will find that 150 ounces of blood are said to have been taken away, in inflammation of the lungs, in a few days. In the twelfth volume of the "Medico-Chirurgical Transactions," Dr. Blundell says that Mr. Hensley, a gentleman on whom he could rely, declared that he had taken away, in two cases of inflammation of the lungs, in men, a gallon and a half of blood in five days; and they both recovered. Precisely such a case is mentioned in the "Medical Gazette," for January, 1829. Dr. Badeley speaks of having taken away five quarts in five days, in a case of peripneumonia; and with perfect success. If a case be very obstinate, and will not yield to proper treatment, you see what there is authority for doing: for these are undoubted facts. I do not condemn such practice; but, from the mode of treatment I have generally adopted, I have never had occasion to have recourse to such profuse evacuations.

I may mention among the effects of bleeding, in reference to the buffed and cupped state of the blood, that two Swiss physicians, (Drs. Prevost and Dumas, of Geneva), who have made many experiments on the blood, say that, when bloodletting has been employed, the red particles are found, after a certain interval, to be fewer in number. There is not only a change, in the disappearance of the buffiness; but venesection lessens the number of red particles in the blood. We know, indeed, that when blood is taken away from an individual in health, its effect is to impoverish the blood. It is now, however, ascertained in a scientific manner, that the red particles are diminished; so that in bloodletting you not only diminish the mass of the blood, but you also lessen its stimulating qualities. You lower its quality, while you diminish its quantity.

Besides *general*, it is sometimes necessary, however, to have recourse to *local* bleeding. Now local bleeding is usually employed in proportion to the less violence of the general symptoms; in proportion to the smaller powers of the patient; and in proportion to the existence of mere congestion of blood, rather than of inflammation. If you find the general state of the patient's system not much disturbed; if there be no great excitement or fulness of the pulse; or if you find the patient very weak, and that there is a great accumulation of blood, rather than inflammation; or if the inflammation is rather of a passive or atomic character;—then, in proportion as this state of things prevails, local bleeding is usually preferred to general. But I believe that, in many cases where *local* bleeding is had recourse to, *general* bleeding would be found to answer the same purpose. At any rate, we are never to allow *local* bleeding, which is performed by cupping or leeches, to stand in the way of *general* bleeding. It is frequently a better practice, even if the patient be weak, to bleed *generally* than *locally*;—to set him upright in bed, or to make him stand upright; and from a large orifice to detract four or five ounces of blood, and thus produce a great effect,—than to apply a number of leeches, and drain away perhaps a larger quantity of the vital fluid. I believe that this is often much the better practice of the two; and I am satisfied that general bleeding is continually omitted, when it might be advantageously adopted;—when it would produce a much more decided effect, and give far less trouble.

I believe that local, is often of great use immediately *after* general bleeding. You lessen the load of blood in the part very materially, by immediately applying a large number of leeches, or cupping. I think that this is really good practice. General bleeding frequently answers every purpose; but I think I have seen the symptoms disappear still more speedily if, after making a great impression upon the system, and lessening the force of blood sent to the part, I lessened the quantity contained in the part, by adopting local bleeding.

Local bleeding may be employed to produce general effects. If it be carried very far, you may see a patient become debilitated by it,—become bloodless. You may see a child, during the operation of leeches, become exceedingly faint. You may produce these general effects by local bleeding; but it is usually a slow process, and the effects of local bleeding are often very local. In a case of pain of the head, I have seen leeches applied to only one temple; and that has been relieved while the other has not. Frequently, when a patient has had pain of the head, I have seen the occiput cupped, and relief obtained there, while the front of the head has remained as before; and when leeches have been applied to the front, I have known the occiput continue painful. This certainly is not invariably the case; but you will perpetually find the effects of local bleeding to be very local. I am not contending against local bleeding. I employ it extensively; but I am always anxious that it should never

supersede general bleeding, if the latter be necessary. It is much better to take a decisive line of conduct,—to make a strong impression upon the patient in an acute disease; and then local bleeding, if employed subsequently, has a far greater effect. It is to be remembered that I have been speaking all along of *active* inflammation.

Local bleeding will sometimes succeed best at a distance. I have know chronic inflammatory diseases of the head, that had resisted general bleeding, and local bleeding at or in the neighbourhood of the head, yield to cupping of the hypochondria, or leeches to the anus. Some think highly of bleeding at the foot.

It is certainly a fact, that the detraction of blood from a distant part, is frequently of great utility; and many think of even greater utility than from the immediate seat of the disease. The ancients were very fond of it,—or at least the older writers,—and supposed that a revulsion was produced;—that the blood would immediately rush from the inflamed part, to that from which the depletion was made. I certainly think that, in this country, the circumstance has been by far too much overlooked. I know that I have had cases of inflammation of the head, (as I will mention hereafter), where repeated local bleedings, even till the patient became pale, proved of no avail; but on taking away blood from the sides of the trunk,—far enough from the head,—the relief was perfect, and the patients got well. I have had several cases of this description. There can be no doubt that the application of leeches to the anus, will frequently produce the most decided relief, in affections of the head, and indeed even of the heart. Whether it is more efficacious than local bleeding from these parts themselves, I can scarcely say. I can only say that I know very great benefit, and even perfect relief, has been derived from the practice. Of course, you know that on the Continent this mode is commonly resorted to; but (from delicacy) it is not usual here; nor do I know that it is obsolutely necessary; but I have seen people who have been treated this way abroad, anxious to have it put in practice; and they have certainly found the most decided relief.

When two or three parts are affected at the same time,—as, for instance, the head and stomach,—it is frequently a good practice to take blood from the anus. One can easily imagine why great relief should be obtained from blood being taken away from that part. The veins there go to form the vena portæ; and therefore a great load is taken from the liver,—a great load is taken from the whole venous system; and less blood goes to the heart. As the hæmorrhoidal veins run to assist in forming the vena portæ, and the latter branches through the hepatic veins to the vena cava inferior, far greater relief is sometimes obtained by this means, than by any other, in diseases of the heart, and affections situated within the chest, as well as in great congestion within the head. Still, however, it is easy to make assertions in Medicine and Surgery; and one ought to have a large number of cases registered for comparison,—shewing where relief has been obtained, and where not,—before we draw any conclusions. General assertions are

frequently not to be depended upon. Extensive and accurate observations are necessary, to enable us to say that one mode of treatment is superior to another. I repeat that I do not know that the removal of blood from the anus is decidedly preferable. Whether the same quantity taken from other parts would be more or less beneficial, I cannot say; but certainly I have been frequently surprised, in affections of the head, on seeing the benefit that is derived from taking away blood around the abdomen, or from the anus.

You may frequently diminish the quantity of blood in a part by position; and this is always to be attended to. Position may increase the quantity of blood in a part; and if you can change the position, of course it would be very bad practice to omit doing so. If a patient have inflammation of the foot, it would be madness to allow it to hang down; or if a patient have inflammation of the hand, it would be equally absurd not to have it kept in a sling. But you may often carry these things farther. It is often of use in inflammation of the foot, not merely to have it on a level with the body, but to have it raised; and the same is the case with regard to the hand. In inflammation of the head, it would be absurd to allow the patient to lie with his head low. By attending to these points, though you are not doing any thing which will cure the patient, yet you are doing that which will enable other things to cure him sooner; and you prevent other things from being counteracted.

Next to bleeding, in the way of evacuation, comes purging. This, I need not say, although inferior to bleeding, is highly necessary; for, in the first place, you remove from the interior of the body a quantity of irritating matter,—of fæces, which are almost always diseased, and will most likely become putrid if allowed to remain. You not only remove this, but you are sure to find the secretions themselves diseased; so that in removing the remains of food, you also remove such diseased secretion as would be more or less poisonous, or at least irritating. Besides this, however, you produce an evacuation of liquids from the vessels of the body; and likewise cause a counter-irritation in a part distant from the inflammation. I presume that you do more or less good in the latter way. In all inflammatory affections of the head, chest, and various parts of the body, you find the intestines disposed to become torpid; the excitement occasioned by the inflammation, causes a depression of excitement in the intestines; and if you increase their excitement, so as to bring them into full action, you in a proportionate manner tend to lessen the distant inflammation. Still it is right not to give very stimulating purgatives, lest you should overdo the thing, and increase the general excitement. The point is, to give those which thoroughly empty the intestines of their contents, and subsequently to exhibit such as produce a considerable drain; but at the same time, you must select those which effect the object without great irritation.

I must here remark, that you are not to imagine, because there are very diseased stools produced, that you are to go on purging, for the purpose of bringing such stuff away; for there can be no

doubt whatever that purgatives, especially if acrid, will cause a diseased secretion. If a person in perfect health take an acrid purgative, you will not find his fæces exhibit the healthy character they presented, previously to the purgative being taken. There can be no doubt that many purgatives, especially if they possess any acrimonious quality, will disorder the secretions, and produce a fœtid discharge from the intestines, which would not otherwise take place. It is not necessary that a patient should have diseased secretions, in inflammation and other diseases, before you administer purgatives. It is often, doubtless, not the case; and it is to be remembered that purgatives will have this effect; and that after a time, when the fæces would assume their natural appearance, they may be kept in an unnatural state by the administration of purgatives.

With respect to the *repetition* of purgatives, as also the repetition of bleeding, that must all be regulated by the violence of the disease on the one hand, and the strength of the patient on the other.

With regard to other evacuants, I do not think much of them. Venesection and purging are by far the chief. Sudorifics are of very inferior use; and, for the most part, if you leave the skin alone, and well combat the complaint with other remedies, you will find that the skin will resume its healthy function, and the patient perspire. I seldom take any trouble whatever with the skin, by the administration of either sudorifics or diaphoretics. If you bleed the patient well, starve him, exclude stimuli, and apply such remedies as I shall presently speak of, you may generally neglect the skin as well as the urine. In inflammatory complaints, when the disease is combated, the urine will come round, without any direct means, and so will the skin. At any rate, if you give stimulating sudorifics you do great harm. In regard to the exhibition of antimony, as it is generally exhibited in inflammatory complaints, for the purpose of producing a moderate diaphoresis, you may just as well treat the patient without it. A few drops of Liquor Antimonii Tartarizati,* in a saline draught, cannot do material good in a severe inflammation. So trifling is the power of small doses of this medicine, that I have now patients at St. Thomas's Hospital, who have taken two or three drachms every three hours, to shew how it can be borne, without any sensible effect whatever being produced. The idea of a few drops of antimonial wine producing any serious effect, in inflammation, is absurd. If you will combat the disease with local and general bleeding and purging, you will find that small doses of it are just as well omitted as not; and I never think of saline draughts, or a few drops of antimonial wine, or any other such pretty things, for the purpose of curing inflammation.

There is, however, another plan to be followed, in the treatment of this disease; and that is, to exhibit counter-irritants (or, as they are called, *contra-stimulants*); so as to produce a strong impression upon the system. The chief of these, I believe, are colchicum, digitalis, antimony (in very full doses), and mercury. In violent

* The *Vinum Antimonii Potassio-Tartratis* of the new Pharmacopœia.

inflammation, and indeed in many violent morbid states of the body, all remedial agents are opposed. You may give in fever, or in inflammation, or in insanity, or in spasm, far larger doses of medicine than you could exhibit in health. In the violent pain of tetanus, for instance, you may give an ounce of laudanum. Some say they have given, in inflammation, an ounce of digitalis in twenty-four hours. I never did; nor have I given a scruple, or half a drachm, of the powder, in the same time. It is certain, however, that in this disease you may give a far larger quantity than you could in health; and it may be laid down as a general rule, that all agents are resisted. Certainly that is the case with mercury; of which you may give a quantity which, in the same individual in a state of health, would induce the most violent ptyalism, and cause all the teeth to drop out. You see that, in violent inflammation, the effect of bleeding on the heart is resisted. The system is in a new state; and many things will not produce that effect, which they would if it were in its natural condition.

Of the first of the contra-stimulants which I have enumerated, I have not any great experience. I have little or no knowledge of the use of digitalis in inflammatory diseases. I know that some say they can cure inflammatory affections with it, unaided by venesection;—so far do some go; but I have really a horror of digitalis. I have seen so many people die suddenly who were taking it, that (whether they died from it or not) it is a medicine of which I am particularly shy; and, knowing the effect of bleeding, together with some other remedies, I have not had recourse to it in any quantity sufficient to control the circulation. I have exhibited it in the dose of a scruple, or half a drachm of the tincture, three or four times a-day; but I never saw it useful in inflammation; and as I never gave larger doses, I cannot say much of it from my own experience.

As to colchicum, there can be no doubt of its extraordinary powers in active rheumatism and gout. There can be no question that so strong an anti-inflammatory remedy as I suppose colchicum is, will produce sweating, purging, and vomiting; and nausea has a great tendency to lessen inflammation; but I cannot say that I have been so satisfied with it, as to make me trust much to it. With the exception of its employment in gout and rheumatism, its utility has not appeared to me so decisive, as to induce me to exhibit it in preference to mercury.

With respect to antimony, it may be given, it is now well known, in far larger doses than could be imagined. I believe it is now ten years, since I found Pulvis Antimonialis * to be in general a very inert thing. I have seen others give two or three grains three or four times a-day, or five-grain doses at night, to make persons perspire;—ordering them at the same time to take plenty of gruel, to bathe their feet in hot water, and put plenty of clothes on the bed; and if they have sweated profusely, it has been all attributed to the antimony. Seeing these things, I was in doubt as to its powers;

* Called, in the Pharmacopœia of 1836, *Pulvis Antimonii Compositus.*

and I went on till I gave people a drachm, or a drachm and a half, and even two drachms, three times a-day. I was satisfied that its want of effect could not arise from the remedy being resisted; and I therefore gave it to patients labouring under itch. It is well, when a patient is rubbing in sulphur, to give something internally, to gratify his wish to have his blood purified. In the cases to which I am referring, I gave the antimony with no effect. I yesterday stumbled on an old hospital-ticket, (I forgot to bring it with me), in which I prescribed 130 grains three times a-day, without its even producing nausea. He took it to see how far we might go. There was little the matter with the man; and as I found that he took one drachm, and then a drachm and a half, of antimonial powder, three times a-day, with no more effect than would have resulted from "powder of post," I gradually increased the quantity, till he took 130 grains three times a-day. In fact, it is a very uncertain remedy. It contains a great deal of phosphate of lime, and peroxide of antimony; and sometimes it contains nothing else; but if you give it with calomel, you may sometimes produce nausea. I will not say that antimonial powder, as it ought to be, is an inert remedy; but as it is commonly procured, it may be given in the quantity I have just stated, in a large number of cases, with no effect at all.

With respect to Antimonium Tartarizatum,* if it be ever so good, it may be given in large quantities. There are many men now in St. Thomas's Hospital, taking half-ounce doses of antimonial wine, in chronic bronchitis, every four hours, without its producing nausea or any thing else. They said, when first taking it, that it made them sick; but they have not felt so since. Many persons give twenty grains of tartar emetic, in the course of twenty-four hours; and I have given, in inflammatory complaints, two grains every two hours. This induces nausea or vomiting at first, but none afterwards; though, after going on for perhaps a fortnight, the patients may be sick again. I have used it in the way I have stated, but I cannot say that I have been satisfied with it. It has not produced the salutary effect I desired. I dare say you may sometimes save a patient's life with it, by the nausea; but you will not save so many as a good practitioner should try to do; nor do I think that colchicum or digitalis can be depended upon like mercury. I have given colchicum and antimony fair trials; and perhaps I am not contented without great success in inflammation; because I think, if we have fair play, we ought generally to cure it. It is an established truth, however, respecting tartarized antimony, that in inflammatory diseases you may give it in these large quantities; and, although a patient may be made sick at first, yet the sickness will go off, and the remedy be borne. I have, however, generally seen the sickness come on at the end of about a fortnight; and then continue as long as the remedy is continued.

I recommend you, if antimony be employed at all, to give Antimonium Tartarizatum. You should give a quantity requisite for

* Now *Antimonii Potassio-Tartras.*

producing nausea; and you then depress the system. You may give a grain every two or three hours. I have myself given 24 grains in 24 hours. There is a man in St. Thomas's, at this moment, who has incipient phthisis; and there is inflammation of the bronchia; consequently he must be treated by antiphlogistic measures. I fear there are tubercles at the bottom of his complaint; and I am therefore not willing to give him mercury; and he has been taking a grain of tartar emetic, every four hours, without nausea. He has taken it for several days, and yesterday it produced sickness for the first time; in consequence of which the frequency of the dose is now reduced to every six hours.

I have made comparative experiments with antimony and mercury; and I am quite certain that the success of those who employ antimony, in addition to bleeding, is very inferior to what those are accustomed to see who employ mercury. In violent inflammation, I really make it a matter of conscience to employ mercury. If there be great danger, as in violent inflammation of the larynx, (where the patient, if neglected, would be dead in a few hours), I do not hesitate to give ten grains of calomel, every two hours. In this case, if you do not bring your means to operate very speedily, the patient will in a moment be suffocated;—he will fall back in bed from œdema in the glottis, and the case be over. In other instances, however, there is no occasion to be so active. Five grains every four hours will do very well; or, perhaps, rather less. In a case where every moment life appeared to be in danger, I have given as much as a scruple, every two hours. These, however, are extreme cases; and in which you are very sure that, if you do not instantly save the patient's life, he will slip through your fingers. If the mercury begin to run off by the bowels, it is better to unite it with opium. It very soon does this; and you see the necessity of resorting to opium; or, if there be an objection to this remedy, you might give an infusion of catechu, which is one of the most powerful astringents. Of course, astringents in *tinctures* must be injurious in inflammation; and it is better to give an *infusion*. Kino, for what I know, is as good as catechu. If the calomel run off in spite of all you can do, you may exhibit Pilula Hydrargyri; but what is still less likely to do so, is Hydrargyrum cum Creta, with which you may salivate a person very readily. I know you will find it stated, in some books, that salivation cannot be produced by it; but I have salivated hundreds with it. You may give a dose of ten grains, every two or three hours; but I think it has a greater tendency to produce sickness, than any other of the three forms of mercury we have mentioned. You will find more patients become sick who are taking Hydrargyrum cum Creta, than of those who take either calomel or blue pill. It is frequently necessary to unite it with opium.

It may be right, also, to rub in mercury externally,—on the extremities and abdomen,—as quickly as it can be done; for the plan is, as far as I know, to get the mouth sore as quickly as possible. It is right, at every visit, to press upon each gum; and likewise to press

under the lower jaw;—to look at the gums, and smell the breath. The moment you find any symptoms of an affection of the mouth, the remedy should be suspended;—you certainly should not go on. In some cases the affection of the mouth will run beyond what you wish; but it is better now and then to have a violent ptyalism, and save nearly all your patients, than to be over particular,—to take too much precaution, and lose a patient now and then. I can state, as a positive fact, that if bleeding be properly had recourse to, and you can produce a certain degree of affection of the mouth, it is very, very rare indeed, that you will lose a patient with acute inflammation;—unless there be some organic disease, that keeps up the irritation in spite of all you can do; or unless your efforts be counteracted by something wrong in diet, or by some violent emotion of the mind, (which must be more than a match for all the best remedies), or by something unusual.

I would strongly advise you,—nay, I am anxious that you should read Dr. Duncan's "Medical Commentaries," published in 1788. All we know now relative to the use of mercury was known then; though it has been considered that the facts known relative to the use of mercury, in many local inflammations, were first generalized by Dr. Armstrong. The general fact is fully stated by Dr. Hamilton. It is singular how often many of us, who know excellent practical things, do not bring them into use when we come into practice. It is a sort of inertness that is apt to come upon us. The paper to which I refer, is by Dr. Hamilton, of Lynn-Regis. He says that he learned the use of mercury from a navy-surgeon;—that having been informed by a navy-surgeon of the great use of mercury in inflammation, he gave it in pleuritis, in hepatitis, and in all the *itises;* and they all yielded in the most extraordinary manner,—in a way that he never found before by any practice he adopted.

But, with respect to the use of mercury, I beg particularly to state, that it is not to make you employ less bleeding beforehand, or at the time you are exhibiting it. So far as there is occasion for bleeding, it is to be put in practice whether you employ mercury, or any other remedy, or no other remedy at all; but you will find as you go on with bleeding, and as you go on exhibiting mercury, that accordingly as the mercury produces its effect upon the mouth, you have less occasion for bleeding. You should certainly bleed according to the necessity of the case, without considering whether you are giving mercury or not. You will find the necessity of practising bloodletting, to be far less than if you gave no mercury at all; but, if you omit bleeding, mercury will not answer your purpose. Bleeding is the great remedy,—it is the "sheet-anchor;" but the addition of mercury renders far less bleeding necessary;—it causes the bleeding which you do put in practice to be ten times more efficacious. It is necessary to have a clear view upon the subject;—not to imagine, for a moment, that it will become a substitute for bleeding; but that it will lessen the necessity of depletion.

Dr. Armstrong used to say, that bleeding was the right arm, and mercury the left arm of medicine, in the treatment of inflammation. That was an excellent expression of the fact.

If it so happen that the mouth becomes too much affected, I do not think you can employ a better application than the chloride of lime, or of soda. If one ounce of the solution be mixed with six or eight of water, and the patient's mouth washed with this lotion every hour, you will find the ptyalism readily go away. If ulceration have taken place, time must be required for it to heal, and the sore mouth may remain for a long time; but if you be beforehand,—if you employ the chloride before ulceration has occurred,—you will find the soreness from the inflammation of the mouth in general rapidly give way. It should be employed just in sufficient strength to be felt by the patient; but not to produce any pain. It is also to be remembered, that if you maintain a free state of the bowels, there is much less danger of a violent affection of the mouth; and if the mouth become affected, and you open the bowels freely, you generally diminish the affection to a certain extent.*

You will find some cases, in which it would be very wrong to employ opium; for instance, in phrenitis. But it is a practice with some, in cases where it is not specially contra-indicated, to give a full dose of opium, after a copious venesection; and, as far as I know, it is a very good practice. Two or three grains of opium, after venesection to syncope, will frequently prevent the necessity of another bleeding; or, at any rate, will send the patient into a quiet sleep, by which he will be very much refreshed. I never myself saw any harm done by it. I know it is a practice, for the most part, void of danger;—unless there be inflammation of the head. I know that it frequently produces a beneficial, soothing effect; and if the bleeding be likely to cause great irritation in the patient,—if the patient be weak, it may be a highly proper practice. It may be wrong to omit it; because it may prevent that morbid irritability,—that restlessness, which sometimes takes place after bleeding; but still it ought not to take the place of mercury; and I would exhibit the latter, just as though I had not administered the former. The chief point should be to endeavour to knock down the inflammation by free bleeding. If you choose, you may follow that up by the local detraction of blood; and you may give a full dose of opium, as soon as the blood-letting is over; but then you should be as anxious to give mercury, as though that were itself the remedy. Still, however, you will cure many, many cases, without mercury; but if it be an object to save as many patients as you possibly can,—which it undoubtedly is,—you will save more if you employ mercury, than if you do not; and with less loss of blood. Mere bleeding will cure many cases;—mere starvation will cure many cases; but if you give mercury, the exceptions to a cure will be reduced to a very small

* In the Meath Hospital, Dublin, great relief was found to ensue (in cases of excessive ptyalism) from the application of leeches below the angles of the lower jaw.

number indeed. It is better, with respect to opium, to give one full dose, than repeated small doses; for it is found that opium has certainly a stimulating effect over the body. Hence the pulse becomes fuller, and there is thirst. If you give small and repeated doses of opium, you know that both thirst and heat will continue. Dr. W. Philip made experiments illustrative of this subject. He applied, to a denuded brain, a small quantity of opium, and likewise of tobacco; and, on looking at the distant capillary vessels in the extremities, he found them very much excited; but if he applied a large portion of either of these ingredients, he found the action diminished;—just the opposite effect. Now that demonstration of the operation of large and of small doses, is perfectly in harmony with what we all observe, when we give large and small doses of these remedies. A small quantity of tobacco, for example, will excite feverishness;—will make a person hot the whole of the night, perhaps; and will induce thirst; whereas a considerable quantity will depress the pulse, produce a cold chilly sweat, and pull down all the powers of life. So with respect to opium; if you want its sedative effects, it should be given in one full dose. This would be dangerous, if you did not bleed; but it is perfectly safe if you have depleted the patient copiously in the first instance.

Supposing, however (what is very likely to happen), that you have overdone the thing;—that either yourself, or some person before you, has bled too much;—you then find opium of the greatest use. If too much blood has been lost, and the patient has headache, throbbing of the temples, frequent syncope, deadly faintness, great rapidity of pulse, vertigo, (and this is a state one continually sees, in women who have lost a great deal of blood during or after labour), then the chief remedy is opium. You will find that all these symptoms are much diminished by it. Stimulants (of which ammonia is one of the best) and good nourishment, are highly proper; but the extreme restlessness of the body is very much alleviated by the addition of opium. I need not say that, in such a case as this, if you cannot prevail upon the patient to eat, it is necessary to use the stomach pump; and strong broth should be injected, both into the stomach and the rectum.

But notwithstanding this state of the system, you occasionally find that a local congestion of blood takes place, so as to render it necessary to apply leeches. When the body has lost so much blood, that you are obliged to give ammonia, and nourishment, and opium, you sometimes find such a tightness of the head,—such a degree of heaviness from local congestion, that the application of leeches, or of ice, is indispensably required. These matters, however, cannot be learned minutely by precept. The requisite knowledge can only be acquired by seeing cases;—by practising yourselves; by acquiring a sort of knack in detecting them. You will see cases where, if you were to take away four ounces more blood, you would certainly precipitate the patient into the grave.

Now with respect to all these things,—mercury, colchicum, and

so forth,—they are general counter-irritants; but we have also frequently to put in practice, in the treatment of inflammation, a *local* counter-irritant;—that is to say, to set up a new action in the neighbourhood, or at a distance. I stated that purgatives chiefly act in this way;—not only in removing a quantity of stimulating fæces, but by exciting the action of the intestines, and so far diminishing action elsewhere. But we also employ certain downright stimulants to the surface; and of these, blisters and sinapisms are perhaps the chief.

It is best, I believe, to apply a blister on the surface over the internal part inflamed; as over the right hypochondrium, in inflammation of the liver; and over the thorax, in inflammation of the lungs; but with respect to the head, this is a dangerous practice when there is any active inflammation going on. The application of cold to the head does great good,—infinite good, in inflammation of the brain itself, or of its membranes; but early stimulating the vertex, by a blister, is equally injurious. Nothing can be worse practice, than to apply blisters to the top of the head in phrenitis, in the early stages of the disease; when, however, you have evacuated the patient sufficiently, then such a measure is very proper. But with respect to other parts of the body, it is best to apply blisters immediately over the internal part which is inflamed. If you want to produce an effect rapidly, a mustard-poultice is one of the best things. Some persons have excited a blister, by causing the steam of boiling water to play upon the part; and others by putting boiling water in a jug, with a napkin in it, and suddenly inverting it; but I think a strong mustard-poultice, beat up with hot vinegar,* will produce an effect as speedily as, in general, is to be desired. In young children, ordinary blisters are often a very dangerous thing; and a mustard-poultice, applied to the abdomen, or the back of the head, or the chest, will produce as great an irritation as you desire; and one which you can control, by removing the sinapism, when the child expresses great distress. For a speedy effect, a large mustard-poultice, to cover the whole abdomen or chest, is certainly one of the best things; and it may be taken off at pleasure. It may be borne for ten minutes;—some will bear it an hour: there is no rule for the length of the application.

I may mention with regard to blisters, that some persons have introduced a solution of cantharides, as a substitute for blister-plaster. I have made some pretty extensive trials with it at St. Thomas's, because it appeared to me a desirable thing to be able to produce a blister, by merely varnishing a part with a brush. It is a much cleaner application than that of an offensively smelling plaster, which a patient has to keep in bed with him for twenty-four hours; but it does not well answer the purpose. A blister was produced, but not immediately;—frequently not till the next day; and then, when it

* Some experiments at the Hotel Dieu, since these observations were delivered, have tended to show that the mixture of vinegar rather diminishes, than adds to, the stimulating properties of the mustard.

was going to heal, a fresh blister would arise. I believe that the young gentleman who applied it for me, did so with a brush, very carefully; but I know that, in many instances, a far more violent blister was induced than I desired; and sometimes it would not rise at all; and, in others, there would be blister after blister. Upon the whole I found it very unsatisfactory; and it appeared to me preferable to continue the old practice, of applying a common plaster of cantharides.

Now in that form of inflammation in which there is little power,—in inflammation which is called *atonic*, (where there is not only inflammation, but the body is in a state of debility,) you must employ less evacuants, and trust more to mercury, and also indeed to opium. Where patients are debilitated altogether, I should certainly place great reliance upon mercury (uniting it with opium) for the purpose of lessening the morbid irritability of the system; and should make the evacuant means chiefly local. I should employ local bleeding; or perhaps should frequently trust much more to blisters, or the application of cold, than even to local bleeding. Still, as I mentioned before, it sometimes may be a better practice, even when there is debility, to produce a momentary effect upon the system, by causing fainting;—by taking away a few ounces of blood suddenly, in an upright posture. But, as a general rule, when patients are of very weak constitution, one would trust more to the *local* than to *general* detraction of blood. It may often be necessary, in these cases, while you take away blood locally, or while you are producing syncope by the detraction of a few ounces, to give good nourishment. It is not at all inconsistent, when there is violent inflammation in a part, and little power in the system at large, to lessen the inflammation of the part by local evacuants, and by cold; and yet to support the whole powers of the system by good nourishment;—not perhaps by wine or porter; but by strong beef-tea, by milk, and other nourishing matters, although you do not give stimulants. In some cases it is even necessary to give stimulants; but these are exceptions to a general rule.

These same remarks apply to what is called *passive* inflammation;—that is to say, where a part is not actively inflamed, but rather in a state of congestion; and where the affection is not so much in the constitution, as in the part itself. In inflammation of the throat, where the throat is very much swollen, and of a dingy colour, without active symptoms; and frequently in inflammation of the eyes, where there is more congestion than real active inflammation;—in these cases local means are by far the best. You do not want to produce an impression on the system; you want to unload the part,—to remove the congestion of blood; and therefore local means are exceedingly proper. In such cases even stimulating applications to the parts are useful. They are in a state of atony; and you may, by stimulating applications, and by astringents, frequently remove the unhealthy condition, even better than by mere local evacuations.

It is of the highest importance to make a correct diagnosis between

an active inflammation, and one of an atonic kind, and a state which is hardly, perhaps, to be called inflammation. You will see, after an inflammation has been very active, that the symptoms will continue; but they are very much modified, being attended with great debility,—with great morbid irritability. Here the remedies of inflammation will make bad worse. It is necessary to remember that, in almost every case of inflammation, this stage may arrive; and it is also necessary to remember, that this set of symptoms may happen in the first instance;—bearing so great a resemblance to inflammation, that one not practised in it, might fall into error. Now this particularly occurs in inflammation of the brain. You will find children displaying many of the symptoms of arachnitis,—acute inflammation of the membranes of the brain, (*hydrocephalus acutus*, as it is called), but without that disease; you will see patients labouring under sudden violent delirium, without any inflammation; or at least so little, that debility (inducing morbid irritability) is the prominent feature of the attack; and if, in these cases you were to take away blood, you would most likely destroy life. The mode of distinguishing these cases, is by observing that there is no great pain; or that if there be any pain it is slight and transient; and that, in the next place, the pulse, (although it may be quick), is feeble;—it is not a pulse which, upon careful observation, you would think justified you in resorting to depletory measures. Then, again, the surface is frequently by no means hot; or, if it be hot, it is only so in a transient manner; and the expression of the face altogether is one of weakness. I shall have to speak upon this subject at greater length, when (in the consideration of particular diseases) I come to treat of hydrocephalus and delirium tremens. But in every case of inflammation, it is possible that after you have treated it actively, and subdued its active inflammatory nature, the patient may fall into a state of morbid irritability; and the local symptoms may still exist, though not of an active kind. You can only judge of it by finding that, whatever local symptoms there are, still the pain is not sharp; that, if not gone entirely, it is much reduced; and that the pulse is one which will not justify you in bleeding. There is a degree of feverishness, so that the pulse may be very rapid; but still it is a pulse of irritability;—one that may be almost extinguished by the finger; and you find an expression of feverishness altogether.

In these cases we must no longer go on with evacuant means. They are highly dangerous. It is necessary to administer good nourishment, and even stimulants; and sometimes to give opium. You will find such a case occur, not only after excessive bleeding, but after inflammation has spontaneously subsided. The local symptoms may still continue in this form; and you will sometimes see this state of things at the very commencement. It is particularly seen in children, in spurious hydrocephalus,—if I may so call it; and likewise in delirium tremens (a spurious sort of phrenitis);—not invariably, however; but in many instances. In such cases you will sometimes have even to give wine, and also brandy; but the utmost

care is required; and it is right that you should know, for your own satisfaction in practice, that you will continually meet with cases, in which you cannot satisfy your mind how far active inflammation may still exist; or how far it is a mere case of irritation;—where you may sit anxiously pondering over every circumstance, and be unable after all to determine what course to pursue. Now, in these instances, I should advise a combination of both plans;—that is to say, support the strength, give moderate stimuli with the greatest caution, and anxiously watch their effects; and at the same time employ evacuants locally,—very moderately, lest you should be doing harm on the other side. Adopt, in fact, a mixed plan; which is by no means inconsistent. After the use of any one thing, you should carefully observe the effects; and draw your conclusion from its action. For example, if you think it right still to apply leeches, while you are giving nourishment, whichever appears the more beneficial, you may be satisfied is the more proper; and that must be steadily pursued.

With regard to *chronic* inflammation, its treatment must depend entirely upon the circumstance of its being active or passive. You have little to do with the duration of the complaint. You are not to consider whether it is *acute* or *chronic;* but whether it is *active* or *passive;* and what are the powers of the patient. You will frequently have occasion to bleed in rheumatism, for example, which has existed for a year or two. I have met with cases where, after rheumatism has existed two or three years, the parts have been so hot that it would have been in vain to attempt to cure them, without local bleeding. Of course, when the disease has continued so long, the powers of the patient will seldom be very great; but you are not to consider what is *likely* to be the case, but to ascertain what the patient's powers *really* are;—what is the degree of activity of the disease; and what proportion it bears to the strength of the patient. In these chronic cases, we should make use of chronic remedies. You can apply, not only leeches and cupping-glasses from time to time, but also means which are not serviceable in active inflammation;—that is to say, issues, setons, and caustics,—so as to produce external ulceration. In *acute* inflammation, whatever is done must be done rapidly; but in the *chronic* form, we can apply setons or moxæ;—we can burn the part, or apply caustic and repeated blisters, or keep blisters open,—I do not know which is best; and we can also produce great irritation by the application of tartar emetic, in the form of ointment, or spread upon plaster. Any of these things may be, in the highest degree, serviceable.

Speaking of caustic, I should have mentioned that there is one form of it, which is frequently of great use, even in certain acute inflammations; and that is nitrate of silver. I believe, in certain inflammations of the skin (of which, of course, I shall speak hereafter) the application of lunar caustic, wetted and rubbed on the part, or a strong solution applied with a brush, is frequently of great use. There is sufficient testimony in its favour; but I have not employed it extensively myself. In one form, however, of violent

inflammation of the skin, I have made a circle all round the inflamed part. I have not touched the inflammation itself; but I have touched a certain portion all around, so as to blacken it; and I have seen it put a limit to inflammation, which threatened to spread to a great extent. I think I have seen lives saved in this way;—by inflammation being arrested, which in all probability would have run on to such an extent, that it must have destroyed life. But of this hereafter.

You will remember, therefore, that, in chronic inflammation, you are to consider whether it is active or passive (without any regard to the period of its duration);—whether the powers of the patient are great or small. I mentioned that, in *acute* inflammation, when you find you have carried depletion, both general and local, as far as is admissible, and there is still quickness of pulse, and considerable irritation existing, you have reason to suppose that the case is now one of irritation; and you have to support the patient well; perhaps to give him stimulants, and to quiet him by opium. So, too, in the treatment of *chronic* inflammation;—when you have persevered for a great length of time; and when you find, notwithstanding all you have done, (constant evacuations, constant draining, constant abstinence), that the signs of local inflammation still continue, you have reason to suppose there is something more than mere inflammation; —that it is not simply chronic inflammation you are treating; but that there is organic disease at the bottom, which is keeping up this chronic inflammation. In fact, for the most part, you have no other reason to suppose organic disease, (unless you find enlargement and induration), in chronic inflammation, but that all you do has no effect upon the inflammation;—that the symptoms continue or arise again, notwithstanding your efforts. In disease of the liver, it is impossible, for the most part, to say whether there is mere chronic inflammation, or organic disease, of various descriptions (such as tubercles),—at least, I cannot distinguish between them,—unless you can feel tubercles forming upon its surface, or can feel a considerable enlargement of the organ. But it is only when you find, nothwithstanding all the rational means you can employ,—and employ in full force, that no progress is made against the disease, that you begin to suppose there is something more at the bottom than inflammation.

In this case it is wrong to go on with mercury, or with antiphlogistic measures, to any extent. You will only increase the mischief by such measures. You must support the patient well. For the most part he will sink gradually under his complaint; but you must take care that you do not make him sink, sooner than he otherwise would. In tubercular, and most other organic diseases, by supporting the patient well, tranquillizing him with opium, and attending to the general state of the constitution, you may protract life, and mitigate suffering; although you cannot cure the disease. I must urge the necessity, however, of exercising great care not to adopt the idea that organic disease exists, either too hastily or too late.

If you take it up too hastily, you will not subdue inflammation that might otherwise be subdued; but if you take it up too late, and go on treating the disease as inflammation that may be subdued, you will certainly hasten dissolution, and cause the patient to sink so much the sooner.

In the treatment of what are called "the terminations of inflammation," you will recollect what I stated formerly;—that it does not necessarily happen that the inflammation ceases, because what are called "terminations" take place. They are circumstances which take place; but the inflammation does not cease because these circumstances occur. We must always inquire, when any of these circumstances (such as effusion, suppuration, or mortification) occur, whether inflammation is still present or not; and if it be present, to what extent, and likewise of what character (whether it is active and tonic, or attended by debility); for the same remedies may be necessary, as were requisite in the treatment of mere inflammation, before these "terminations" (as they are improperly denominated) took place. You have to treat the inflammation present accordingly as it is *active*, or more or less *passive;*—accordingly as it is tonic,—attended with strength of constitution; or accordingly as there is no power of constitution, whatever may be the activity of the part itself.

You have also to treat effusion and suppuration as *inflammatory* or *not inflammatory;* because sometimes there is no inflammation. If it so happen that fluid is generated;—whether that circumstance has taken place which in called *effusion;* and which is merely an excessive secretion or collection is a serous membrane; or whether suppuration has taken place, so that matter has collected;—in either case, it may be necessary to let out the fluids; because fresh symptoms may arise from their pressure. This is frequently necessary in a collection of pus; and also in the case of mere effusion, or of fluid collection, in a serous membrane. You may liberate the lungs, and avert impending danger, by allowing the escape of fluid effused in great quantity into the thorax; and some say that you may do the same with respect to the pericardium; but of that I never knew an instance. It sometimes may be necessary in the case of the peritoneum. With respect, however, to pus, the escape of it by art is of the utmost importance; because it is found that it not only injures by its mechanical pressure and distension, but that it frequently causes great mischief to the constitution, by its peculiar properties. If the matter be confined, you will sometimes see the system in a state of great depression, the tongue brown, and the pulse feeble; but on making a free incision, and letting out this fluid, the constitution will rally,—perhaps in the course of a day. When there is a mere collection of serous, or diseased serous fluid, diuretics are frequently very useful; but for the most part, the remedies of inflammation, moderately continued, are among the best means. By still giving mercury, and by continuing low diet, you cause absorption of the fluid to take place; and you do much better than merely cause

absorption of it;—you prevent its increase; and if you can b.. that object, nature, in a large majority of cases, will get rid of it by herself. Among the remedies that answer both purposes, colchicum and digitalis will be found useful. They will perhaps lessen the action that is going on ; and keep down the fluid, and also tend to lessen previous effusion. Colchicum, from exciting the kidneys, and also the alimentary canal, is particularly suitable; and so is mercury.

If a discharge have been accomplished by art, or if nature herself have effected a new opening, then you find it necessary to support the constitution well, for the purpose of enabling her to bear this copious discharge; but still it is frequently necessary, at the same time, to adopt more or less of an antiphlogistic regimen,—to give abundant nourishment; but not, indeed, of a stimulating kind.

You may see good reason for not supposing that the necessity of antiphlogistic treatment is over, even in the instance of ulceration and of mortification; which are also called "terminations of inflammation." An ulcer is frequently owing to nothing more than the inflammation around. In the case of a sore nipple, I have seen this over and over again. When the breasts have been so sore, that the mother dreaded the agony of suckling her child, the ulceration has frequently been cured, by merely applying leeches at some little distance from the spot, but still on the breast;—subduing the inflammation there, and afterwards keeping it down. So in the legs;—it is very common for an ulcer to take place in them, and yet not to heal; simply because there is so much inflammation around. Here plasters and ointment are of no use; but if you bleed the patient well, and purge him, you take off the tension and fulness of all the vessels. You subdue the inflammation, and nature then has power of her own to heal the ulcer. It may be just the same with respect to all the terminations of inflammation.

Even in mortification we have to consider whether there is inflammation going on or not; and whether it is attended by tolerable strength of constitution or not. Inflammation may attend mortification after it has begun,—when it is decidedly going on. The inflammation may be really active;—there may be great redness of the part, great pain, and great heat; and there may be tolerable strength of the constitution at large. On the other hand, the inflammation may be more of a passive kind;—the part may be dingy, swollen, and not in much pain; and the strength of the constitution may be in a deplorable condition. It is often necessary, particularly in mortification, to employ local antiphlogistic means, while you support and sustain the system at large. The system itself is in a bad state; and therefore you have to support it with the best of nourishment, and perhaps with wine, or even brandy; whereas the part itself is disposed to run into a state of excitement; and mischief arises from such treatment, unless you prevent the action of the part itself,—perhaps by the application of leeches, and perhaps by that of cold. Occasionally, of course, in mortification, it is wrong to employ soothing measures. You must adopt means of the most stimulating

description; but it is to be remembered that, frequently, the more you stimulate the part, the greater will be the mortification. If there be great irritation, you will find a poultice of carrots or turnips answer a very good purpose. The more you irritate, in many cases, certainly the greater will be the extent of the mortification. If, however, a stimulus be absolutely necessary, then the oil of turpentine, I believe, is the best. Sulphuretted oil is often very good. I have seen the mortification stop, apparently through these applications, when the constitution was well supported; but it is to be remembered, that these things are only to be employed when there is no violence of local inflammation.

It is always an object to prevent the gangrenous parts from injuring those that are not yet in a mortified condition. There can be no doubt that putrid animal substance is, in the highest degree, poisonous; and it is very necessary to prevent it from acting on the living part, and to prevent also the stench which proceeds from it. The latter may be removed, pretty easily, by charcoal-powder put into a fermenting poultice. Stale beer-grounds and yeast are very serviceable; but, above all, I should recommend the chloride of lime, or of soda, to be continually applied. It is necessary, however, in using these applications, to remember that they must be continually applied;—not two or three times a-day; but as one portion of the solution of the chloride dries, so a fresh portion must be employed to counteract the putrescent tendency. You see them, for the most part, inefficiently employed; and, unless you look after nurses and attendants, they will not apply them sufficiently to remove the stench.

In mortification, bark was formerly much praised; and was even thought to be a specific. But that cannot be the case; for sometimes there is great excitement of constitution, requiring antiphlogistic means. At other times, however, in an opposite state of the system, where there is mortification with debility, bark may be of great use, and especially sulphate of quinine; for, in mortification, it is common for the stomach to reject bark. A combination of musk and ammonia, I have frequently seen arrest mortification;—at least apparently. I say *apparently;* because in such a case it is your duty to support the constitution well at the same time; but musk and ammonia united, and given every few hours, have appeared to answer a good purpose; and have been particularly extolled by some practitioners. In nearly all these cases of mortification, opium is useful. There is great general suffering,—great general restlessness; and it is an object to lessen the suffering, and tranquillize the system at large.

It might be supposed that, if you removed the mortified part, you would put a stop to the mortification. On reflection, however, you will see that it would be bad practice. The mortification of a part depends, generally, upon the state of the constitution; and the fresh wound caused by amputating the mortified part, will fall into the same condition; because it is not the *part* that is so much in fault, as the *constitution.* If, however, the mortification depends entirely

upon local circumstances, you may cut off the mortified part with safety. Supposing an artery has been injured to such an extent as to cause its obstruction, and that the part supplied by it dies from the want of blood, the part may be removed without any danger whatever of the disease spreading; because the mortification depends upon a local cause, and not upon the constitution; and the fresh wound will not fall into the same predicament as the mortified part. In almost every case, however, where the mortification does not depend upon a local cause, it is the best practice to wait till nature herself has pointed out that the mortification will not spread; —till a line of separation has begun;—and till you see that the powers of the constitution are sufficient to repair the injury;—that the constitution is not in a condition for the mortification to spread higher up; but that, on the contrary, nature is capable of the healing process. Then you remove the part, and effect the object that nature herself was carrying on; and you do it better. It is of great importance, in the treatment of mortification, to recollect these few particulars.

The observations that I have now made refer to *common* inflammation; but I stated that inflammation may also be *specific;*—and that we term inflammation *specific*, when it runs a very peculiar course, or arises from a peculiar cause. Gout is termed a specific inflammation; because it runs a very extraordinary, and very peculiar course. Small-pox is also an instance of specific inflammation. It not only runs a peculiar course;—beginning on a certain day, and undergoing certain changes on others; but it arises from a special cause, which will produce no other disease. Gonorrhœa, also, is a specific inflammation;—having its origin in a cause that will induce no other disease.

In the treatment of this species of inflammation, we sometimes have prophylactic measures, and can prevent these affections altogether. The disease of small-pox may be prevented, in the majority of instances, by the cow-pock. Then for some of these we have a specific remedy. For itch, which is a specific disease, we have sulphur; for syphilis, we have mercury. For the greater part, however, of these specific inflammations, we have no specific remedy; and even if we had, it would still be of the highest use to treat them on the principles of common inflammation. Where we have certain remedies, as in the case of itch or syphilis, still we must keep in view the remedies of common inflammation; because you must recollect that *specific* is *common* inflammation, with something superadded to it; and by adopting common treatment, in addition to specific, the cure is much accelerated.

Some inflammations are specific at one time, and not at another. There can be no doubt that, in general, ophthalmia is not a contagious disease; but we have every reason to believe that sometimes it is. Even erysipelas has appeared to be contagious. I think I have seen a person die from erysipelas caught in this way;—at any rate, you may see some strong reasons (which I shall notice more parti-

cularly hereafter) for supposing it to be contagious, in a paper published by Dr. Wells, late of St. Thomas's Hospital. Catarrh is sometimes specific. A common "cold" is an instance of common inflammation; but now and then there is an epidemic catarrh, which depends upon some peculiar cause in the atmosphere, and not on the common causes of inflammation. It is a singular fact, that inflammation may be specific at one part of its course, and not at another. Gonorrhœa is an instance of specific inflammation at first; but no doubt, after a time, it ceases to be contagious. When that time arrives we do not know; and therefore it would be bad policy to speculate on the presumption of its having occurred; but I think it is pretty certain that inflammation in the urethra, sufficient to keep up a discharge, will continue long after any contagion is to be feared.

I mentioned that not only the chief essential symptoms of inflammation (such as swelling and pain) would sometimes arise from other causes; but that even other circumstances occurring in the course of inflammation, and in the course of what are called "terminations of inflammation," will not only take place with inflammation, but sometimes without it. Now, among the circumstances which take place in the course of inflammation, or among the terminations of it, are discharges and collections. These may be sometimes mere results of inflammation; or they may be closely connected with inflammation; and sometimes they may occur without any inflammation at all. One of these discharges consists of blood; another is a discharge of mucus; another is not a discharge, but a collection of serous fluid. A discharge of blood is called a *hæmorrhage;* a discharge of mucus is called a *flux*, or a *catarrh*, or a *gleet*, or a *profluvium;* the excessive collection of serous fluid that cannot be discharged, is called a *dropsy*. I shall therefore embrace this opportunity, before I come to the consideration of changes of structure, (which are frequently the result of inflammation, though sometimes not), to consider, in a general way, hæmorrhages, fluxes, (or profluvia), and dropsies. These are frequently the mere result of inflammation; frequently they are closely connected with it, though perhaps not altogether the result of it; frequently they occur without any inflammation being present; and they will frequently continue long after inflammation can be supposed to exist. We shall find it just the same with respect to organic changes. Changes of structure, induration, and softening, are every day the effect of inflammation; but every day they appear not to be so.

HÆMORRHAGE.

Hæmorrhage frequently occurs in inflammation of a mucous membrane,—particularly of the mucous membrane of the intestines and of the urethra, and less frequently in inflammation of the bronchia; but it is a common occurrence to see the most violent inflammation of a mucous membrane, without the escape of a single drop of blood. Why it happens that inflammation of a mucous membrane should, in one case, be attended by hæmorrhage, and in another not, I do

not think we can explain; but, nevertheless, such is the fact. Inflammation of a mucous membrane, may occasion a most profuse discharge of blood;—or, at least, a discharge of blood, whether profuse or not; and this will frequently take place without any violent inflammation. You see that inflammation exists; but you cannot believe it is the sole cause of the hæmorrhage. That the hæmorrhage is inflammatory, is all we feel justified in saying; but it is scarcely the result of an inflammation; and in other cases we may see no symptoms of inflammation at all.

If hæmorrhage occur with signs of inflammation,—with pyrexia; with a pulse full, or hard, or quick; together with pain and heat,—we then call it an *active* hæmorrhage; just as we should call an *inflammation* active, in similar circumstances. The disease is then to be treated simply as inflammation;—we have to treat the inflammation, and the hæmorrhage will subside. We have in general to bleed the patient; and we most likely find the blood buffed and cupped; but not, of course, in every case. We have to purge the patient, as in inflammation; and it is often quite safe and proper to give mercury. We must keep the patient on the same low diet that we do in inflammation, and must apply cold. The latter is particularly useful in such a case.

But, like inflammation, hæmorrhage may be *passive*. There may be no pain, or but little; no heat; no pyrexia; no quickness and fulness of pulse; or, if there be quickness, the pulse is at the same time feeble. There may be, in such a state of things, congestion in a part, or there may not;—that is to say, all the veins may be distended; or the extremities of the vessels only may be pouring forth blood, without any congestion. When hæmorrhage takes place without any symptoms of inflammation,—without pain, without heat, without fulness or quickness of pulse,—the part itself may be in a state of congestion; but, on the other hand, that is sometimes not the case. You may, on opening a patient, find great congestion of all the vessels; while in other cases, you find the most extreme paleness. Where there is a considerable discharge of blood, and no signs of inflammation at all, and symptoms of great fulness of blood in the part, I believe in general it is venous. This sort of hæmorrhage will sometimes be altogether mechanical. There may be an obstruction of some of the leading veins; and the blood may be poured forth, of course, mechanically. An obstruction in the spleen, or in the liver, is a common cause of a discharge of blood from the intestines; but this discharge will sometimes take place without any obstruction; in which case there is a peculiar state of the body, not well understood. For instance,—in typhus fever, in small-pox, in scurvy, and in that peculiar disease called *purpura*, one cannot tell why blood should be poured forth: but it frequently is, and that in great abundance; and yet there may be no signs of inflammation. A solution of continuity in some of the large vessels, of course affords another instance of passive hæmorrhage. There is no inflammation there. You have a mere passive discharge, from the want of me-

chanical resistance; but the want of mechanical resistance will not explain all cases of passive hæmorrhage; because you have cases of the most extreme debility of body, where the patient has no hæmorrhage; and frequently there is hæmorrhage of a passive kind, without inflammation, where there is not such an intense degree of debility.

We must consider that, in these two forms of hæmorrhage, the state is totally different. In *active* hæmorrhage,—that which resembles active inflammation,—the blood is, as it were, *forced* out; whereas, in *passive* hæmorrhage, the blood is *let* out. In active inflammation, there is an intense circulation going on in the part; that is to say, the blood *may* be moving more speedily than natural,—I do not say it *is;* but at any rate there is a *large quantity* of blood *moving* through the part; the action of the heart is strong; and the blood is forced out of the extreme vessels. We have, therefore, only to moderate the force of the blood; and the hæmorrhage for the most part ceases. But in passive inflammation, the force with which the blood is impelled to the part is not increased. There is no great impulse behind; the blood is not driven on; but the extremities of the vessels are so relaxed that the blood escapes,—is let out. We have therefore to employ different means;—not to stop the force of the blood, but to close the open extremities of the vessels as much as possible, and to diminish their diameter; so that the blood may not be thus *let out.* In active inflammation, all the astringents, all the stimulants, and all the compression you could employ, would do little or no good; for there is an active hæmorrhagic tendency. The blood is driven on with great force; and if you merely treat it as inflammation, the hæmorrhage, for the most part, ceases; whereas, in *passive* inflammation, if you were to annihilate the force of the blood from behind, by debilitating measures, you would only increase the mischief;—you would only increase the relaxation of the vessels, and make them more liable to give way than before. In mixed cases it is right to employ both modes. You must always remember that a great number of cases are inflammatory; and that others depend entirely upon relaxation.

It is to be remembered that these two hæmorrhages, active and passive,—just like active and passive inflammation,—run into each other; and it is sometimes difficult to say what treatment we ought to adopt. In fact, we are under the necessity of adopting both plans;—of keeping down activity in the part, while we moderately support the system at large. You have to adopt just the same treatment that I mentioned, as necessary in a doubtful, combined case of active and passive, or tonic and atonic inflammation. Accordingly as the pulse is not quick,—or as it is not full and strong,—or as there is little pain or heat, you may adopt the remedies for passive or atonic inflammation. In proportion as you find the pulse strong or quick, (provided there is still a certain degree of strength of the system), and as you find heat in the part, so you must adopt antiphlogistic measures more vigorously. Local means must sometimes be had

recourse to, for diminishing excitement; while at the same time you support the constitution. But if you find the hæmorrhage is decidedly of a passive character,—so that it is out of the question to think of treating it as inflammatory by bleeding and purging,—you have to trust more to the application of cold to the part itself; and to local, and perhaps even general, astringents.

Cold may be applied to the exterior of the chest, in spitting of blood, with the most perfect safety. I have known phthisical patients to sit up in a chair, with scarcely any thing upon them, and to have ice laid on their chest, without the least suffering being produced, or any unpleasant circumstances resulting. In hæmorrhage from the kidneys also, it is a good practice to apply ice to the loins; and in cases of profuse discharge from the alimentary canal, I should not hesitate to give ice by the mouth and rectum, and to place it on the abdomen.

With respect to internal astringents, I doubt very much the efficacy of nearly all of them, except in the case of hæmorrhage from the alimentary canal; in which case you may employ catechu or kino with great advantage; for here you apply the remedies as locally to the part itself, as if you applied them to the surface of the body, in cases where the latter is diseased. But with respect to those astringents which are intended to be absorbed, and thus to operate on a distant part of the body, I very much doubt their effect; unless they are of a saline character, or are readily absorbed. There can be no question of the efficacy of superacetate of lead. I have proved it to my own satisfaction over and over again. But with regard to vegetable astringents, I very much doubt whether, in a case of profuse hæmoptysis, for instance, you can do good, even if you fill the stomach and intestines with catechu and kino. You may operate, however, on distant parts by means of *metallic* astringents, provided you give those that may be quickly absorbed; and the superacetate of lead is certainly the chief of these. With regard to the dose, one would not imagine beforehand (knowing the ill effects of lead) that you could give the large quantity that really may be borne. Not only may one or two grains be given every six hours, but two or three grains may be exhibited every two or three hours, for some days, with the most perfect impunity. I know you may give a scruple of it in the twenty-four hours, and even more,—nearly half a drachm, with perfect safety, provided you carefully attend to the state of the patient's bowels; and I know that such doses are sometimes necessary, because I have found no effect produced till I have brought the dose up to that point. For a time, there is no occasion to push on the doses so quickly; but if you see the hæmorrhage obstinate, it is then necessary to do so. I have seen a stop put to the hæmorrhage, when the dose had arrived at a certain point; and when the dose was lessened, from a desire of not overdoing it, the hæmorrhage returned. The only inconvenience I have known to occur, has been violent pain of the limbs. It is necessary to attend to the patient's bowels;—to take care that they

are freely opened every day; for it would be madness to give it otherwise. With this precaution, however, it is perfectly right, I believe, in passive hæmorrhage, to give superacetate of lead very freely. The pain of the limbs is of no consequence, if you save life. A patient, on such terms, may well bear pain for some little time after his recovery; but even this may generally be removed by employing the warm bath, once or twice a day, and by the administration of colchicum.

Sulphuric acid is another astringent, which, when taken into the stomach, exerts an influence over a profuse discharge;—not *hæmorrhage*, but profuse *sweating*. I think there can be no doubt that sulphuric acid does check profuse sweating. I think I have seen the same effect result from nitric acid; but sulphuric acid will undoubtedly check the most profuse perspiration.

The application of cold, and of astringents with the cold, and the administration of astringents internally, are among our chief measures in passive hæmorrhage; but you will frequently find the oil of turpentine answer a most excellent purpose. We have all seen it stop profuse hæmorrhage from the nostrils, by being introduced with a plug of lint; and I have seen a similar effect produced, in hæmorrhage from mortified parts. I do not know that it will stop hæmorrhage from internal parts, except the alimentary canal and the kidneys; but it will stop hæmatemesis and melæna;—that is, a discharge of blood from the stomach, upwards or downwards. I have had cases, almost innumerable, illustrating the great utility of this remedy. It so happens that, during the last six months, I have had a large number of such cases,—more than I ever had during the former period of my practice; and oil of turpentine has proved a most efficacious medicine. It should not be exhibited in large doses;—that would do harm, by producing vomiting and purging; which, in such cases, might be fatal to the patient. Twenty drops should be given, every three or four hours. I have also seen it stop hæmorrhage from the kidneys. I have known people take it of their own accord, where I should have been afraid to give it. I have known it taken in active hæmorrhage from the kidneys, and put a stop to it; but where the hæmorrhage was active, I would first treat it as inflammatory; and then, after a time, give oil of turpentine. If the hæmorrhage proceed from a part which you can get at, and you cannot succeed in stopping it by other measures, compression (by means of a ligature, compress, &c.,) may be necessary; or even the application of the actual cautery.

Although it is generally the mucous membranes which pour forth blood, the skin, without any abraison, has been known to do the same. I never saw an instance of the kind, but I have read of bloody sweats; and they occur in persons who have been bitten by some poisonous animals. Curious cases are to be met with in authors, of blood oozing from various parts of the body. There is an account in an American Journal, of a person from whose cheek blood suddenly oozed in considerable quantity, without there being any abrasion.

Ulcers will frequently afford a great quantity of blood; but this especially occurs in women whose menstruation is deficient. There have been some curious instances of the vicarious discharge of bloody fluid. If menstruation be suppressed, it is not uncommon for women to have an ulcer break out on the legs, and for it to bleed once a month; or, if there have been an ulcer before, for it to take on a bleeding character. I have seen hæmorrhage from the chest take place in the same way. Hæmorrhage has taken place once a month; simply because the menses were suppressed.

With respect to predisposing causes, is in young persons that we have active hæmorrhage; and it is in middle age and advanced life, that the passive form generally occurs. Of course, there may be exceptions to this general rule. In children, it usually takes place from the nose; in young adults from the lungs and air-passages; in elderly people chiefly from the abdomen; but they are likewise subject to hæmorrhage within the head, producing apoplexy.

Women,—old, young, and middle aged,—are very subject to hæmorrhage from the stomach; and also to hæmorrhage from the intestines, though in a much less degree than to hæmorrhage from the stomach. This hæmorrhage from the alimentary canal in females, is generally of a passive kind; and will generally bear astringents from the first. It does not require any great extent of bleeding. In the menstruating period of a woman's life, however, the uterus is very subject to hæmorrhage; and this often inflammatory. Many, many cases of menorrhagia,—without pregnancy,—without delivery, have I seen yield presently to one or more bleedings, combined with low diet; whereas all the astringents you could give, would be of no use in this *inflammatory* hæmorrhage,—attended with pain of the loins, heat of body, and quickness of pulse.

Besides this predisposition to hæmorrhage from certain parts, depending upon age, there are others depending upon other circumstances. There is sometimes a constitutional tendency. Certain persons are known to be subject to hæmorrhage from certain parts; and some persons are subject to hæmorrhage in general; so that if they have a tooth out, they will always bleed profusely; or, if they cut their finger, it will continue to bleed for many hours, in spite of means that are used. There is certainly, in many people, an hereditary predisposition to hæmorrhage. In some of these, an extreme thinness of the arteries has been found. After a tooth has been extracted, it has been found necessary, from the profuse hæmorrhage, notwithstanding the actual cautery was employed, to tie the carotid artery; and it has been found that the arteries were even thinner than the veins in other people.

The *exciting* causes of hæmorrhage, are whatever propels the blood violently, either generally or locally; and whatever mechanically accumulates it; such as posture, the application of a ligature, or obstruction in any part. Another exciting cause of hæmorrhage, is the suppression of a discharge, or the sudden cessation of a natural

discharge; such as the entire or occasional suppression of the menses; the suppression of hæmorrhoidal discharge; the suppression of diarrhœa. Indeed, the sudden cessation of a disease to which a patient has been very subject, although not a hæmorrhagic disease, is sometimes attended by hæmorrhage from an internal part. I need not say that a solution of continuity is a common cause of hæmorrhage; and of course it is then of a passive kind.

In hæmorrhage which proceeds from the nose or the lungs, the blood is generally florid; whereas that which comes from the stomach and intestines, is generally of a venous character. But the circumstance of the blood being black, does not necessarily prove that it comes from a vein. I may assume that colour from remaining some time in the stomach or intestines, before it escapes; for blood, if allowed to be perfectly still, and not exposed to the air, will become black. If you tie an artery in two places, the blood between the ligatures becomes venous in its character; and therefore blood discharged from the stomach and intestines, though it *may* be venous, may yet be really arterial;—having become black, merely from staying a considerable time in that situation, previously to its discharge. In apoplexy, the blood effused within the head appears to be venous; but its black colour may be merely from the reason I have just stated.

The uterus is particularly subject to hæmorrhage during pregnancy, and during and after delivery; but then the reason of this is for the most mechanical. Inflammation, if not the cause of menorrhagia in women who are not pregnant, and have not lately been delivered, is, at any rate, a very common attendant circumstance. Menorrhagia that has nothing to do with the impregnation of the womb, is generally of an inflammatory character. An inflammatory state very often produces hæmorrhage from the intestines, and from the urethra.

In the head, and from the lungs, the stomach, and the intestines, we often have hæmorrhage from merely mechanical causes;—from ulceration, or solution of continuity. One cause of hæmorrhage in the head—apoplexy, is brittleness of the vessels, or tenuity of them, or ulceration of the blood-vessels of the head. Hæmorrhage from the lungs often arises from a mere inflammatory state of the bronchia, or of the air-cells. In phthisis we sometimes have hæmorrhage from ulceration; for although nature endeavours to prevent hæmorrhage by forming adhesions, and plugging and contracting arteries, yet sometimes an ulcer will, in phthisical cases, produce hæmorrhage, and sometimes sudden death. With regard to the stomach, hæmorrhage will sometimes occur from ulceration; and death may be the consequence. The same thing will take place in the intestines. There may be an ulceration of even a malignant character; and every now and then profuse hæmorrhage is the consequence. It will also of course come on, in many of these parts, from mechanical violence. It is very common for a person to spit blood after a blow

on the chest, or a fall. It is also common to make bloody urine after a blow upon the loins; and to discharge blood from the intestines after a fall.

It is right to remember that you may not only have profuse hæmorrhage from the mucous membrane of the bronchia, from the stomach, from the intestines, and again from what is nearly a mucous membrane,—the interior of the kidneys, and indeed of the urinary bladder; but that other parts are sometimes the seat of fatal hæmorrhage. I have known hæmorrhage take place into the pericardium, and prove almost instantly fatal; and I have read of cases, occurring in one's own time, of sudden and fatal hæmorrhage into the spinal sheath, without any evident cause. In fatal cases of hæmorrhage into the pericardium, it is said that the heart and the pericardium were found soft. In the case that I saw this was a fact; and, as far as I can ascertain, it was the case in other instances.

When hæmorrhage occurs from a mucous membrane, I believe it is, for the most part, from a large number of minute vessels. It is extraordinary what a profuse hæmorrhage you may have in a very short time,—so as to prove fatal in a minute or two,—without any vessel whatever being found injured. I recollect distinctly having a patient with some pulmonary disease,—phthisis, I believe,—who was sitting up in bed. Suddenly blood came from his mouth; he fell back, and was dead. On opening him we found the stomach filled with blood; there was an immense coagulum, exactly forming a mould of the stomach; but after examining every part of that organ, with the most minute attention, I could not discover the orifice of any vessel whatever. The same has been observed in the case of the pericardium. I think you will find it mentioned, in Dr. Baillie's work on "Morbid Anatomy," that cases have occurred, both in mucous and serous membranes, in which he was unable to find a vessel which appeared to have poured forth blood. The pericardium, for example, will suddenly allow the escape of an enormous quantity of blood.

PROFLUVIA.

Fluxes, catarrhs, or profluvia, form the next class of affections we shall notice. They are precisely similar in principle to hæmorrhage, and occur from those parts which are most frequently the source of the latter;—namely, from the mucous membranes. Fluxes occur particularly from the nose, the bronchia, the intestines, the bladder, the urethra, and the vagina. Those parts which, during inflammation, will frequently pour forth blood, will also, during the same period, pour forth a much increased secretion. In the first instance, their secretion is increased; it afterwards declines, but does not come down to the standard of health; and then, as the inflammation subsides, the secretion becomes excessively abundant. You have, therefore, inflammatory fluxes, or catarrhs, (or whatever name you choose to give them), from the mucous membranes;—exactly as you have inflammatory hæmorrhages; and after all the signs of inflammation

have subsided, you will frequently have these discharges continue. You have, however, another form, where there is no inflammation to be discovered;—where the mucous membrane will pour forth a vast quantity of liquid, for a length of time, and that without any signs of inflammation being present. You have passive fluxes, exactly as you have passive hæmorrhages. The only difference is, that in the one case you have blood, and in the other you have a secretion.

I mentioned that the skin, which almost ranks with mucous membrane, and belongs to the same family of structures, will occasionally, though in very rare cases, pour forth blood. The skin, however, will every day pour forth an immense quantity of its own secretion. The term "*flux*," "*catarrh*," or "*profluvium*," would not be given to a discharge from the skin; but just as the mucous membranes pour forth their discharges in excess, so frequently does the skin. Profuse sweating is analogous to profuse discharges from the mucous membranes. Now we have sufficient proof that excessive discharge from the skin is, more frequently than not, quite devoid of an inflammatory character. In fact, in the highest debility,—in the debility of syncope, in the debility of death,—the skin will secrete most abundantly. Just so it is, undoubtedly, with respect to the mucous membranes. They will secrete most abundantly, without any signs of inflammation at all. It has been imagined that, whenever a mucous membrane secretes in excess, it must be in a state of inflammation. But I think the instance of the skin, which is alluded to by Andral, is sufficient to show that the mucous membranes likewise may be in a similar state, without any inflammation. He says (and it is a happy thought of his) that the skin will secrete in the greatest abundance,—will sweat profusely, without any marks of inflammation. This instance of the skin would enable us to say, *à priori*, that the same thing is possible with respect to the mucous membranes. But I think, *à posteriori*, we can assert that mucous membranes will secrete most abundantly, without inflammation; for after fluxes these membranes are often quite pale after death;—just as they often are after passive hæmorrhage. It appears to me to be a case analogous to that of inflammation itself; and also to that of hæmorrhage. I think you may have an *active* secretion from the mucous membrane, and from the skin (as in acute rheumatism); or you may have it entirely *passive*,—without any mark of inflammation.

The treatment of these fluxes, is precisely the same as the treatment of inflammation or of hæmorrhage. If they be of an active kind, attended with strength of pulse, pyrexia, heat of body, pain of the mucous membrane itself, (the pain which is characteristic of inflammation of a mucous membrane, and is increased by pressure), astringents are altogether improper. At any rate, they are altogether useless; just as they are in active hæmorrhage. It would be just as absurd to attempt to cure these discharges by astringents,—to stop the discharge of gonorrhœa, for example, during the violence of the inflammation, by an astringent injection,—as it would be to

attempt to stop an active hæmorrhage by such means. You have only to lessen the inflammatory state by bleeding, and the discharge will become diminished, or be put into a course of diminution. Perhaps there will be a momentary increase; but it is followed by a diminution, exactly as is the result in an active hæmorrhagic process. When there is no inflammation present, or the inflammation is subsiding, you may apply local means (such as stimulants and astringents) with the greatest advantage; in fact, they then become the proper remedy. If it so happen that no inflammation occur from the very beginning, you may at once apply stimulants and astringents. The instance of the urethra, which is almost before one's eyes, is a good illustration of all that occurs in the various mucous membranes of the body. You will have, in inflammation, an increased secretion; and the inflammation and secretion are only to be subdued by anti-inflammatory measures; but you will have, at last, only a passive discharge; and then anti-inflammatory measures will only increase the mischief, and stimulants are to be resorted to. Sometimes you will have so little inflammation, that you may disregard it from the very first. It is just the same in diarrhœa. In diarrhœa, frequently the best remedy is to bleed the patient, to starve him, to leech the abdomen, to blister him; to give no astringents whatever, but sometimes even moderately to purge him, in order to increase the effect of the treatment; and then the inflammatory state will subside. In other cases you have to give astringents and opiates; and support the patient well; and in that way he recovers. It is the same, too, in bronchitis. In active bronchitis, any remedies which stimulate the air passages, would be highly injurious. You have only to bleed the patient well, to starve him, and to treat him as labouring under inflammation, and the discharge of mucus gradually subsides; whereas if you have, in an old man, a profuse discharge from the bronchia, (forming what is called *catarrhus senilis*), without inflammation, but accompanied with emaciation and paleness, you must give tonics and good nourishment. Such stimulants as snake-root (*Polygala Senega*) answer the purpose best.

DROPSY.

There are other affections which, though they relate to other structures of the body, are in all respects decidedly analogous to fluxes and hæmorrhages; and these are called *dropsies*. A dropsy is not an affection of the *mucous*, but of the *serous* and *cellular* membranes. The fluid here is secreted in such excess, that it is not absorbed proportionately; and as the serous and cellular membranes are closed parts, of course the fluid does not escape, as it does from the mucous membranes; so that instead of a discharge you have a dropsy. That is the sole difference between these two affections. In the one case the effusion escapes, and in the other it does not. These collections take place in the arachnoid, the pleura, the pericardium, the peritoneum, &c.; together with the general cellular membrane of the body. They are very often of an active inflamma-

tory kind; and are to be treated, not by diuretics, but simply by the remedies of inflammation. In the arachnoid, the pleura, and the pericardium, for instance, we every day see dropsy with the most decided inflammation, both acute and chronic. Sometimes, though not so frequently as in the cases just mentioned, we see dropsy in violent inflammation of the abdomen; but very often ascites itself is a decidedly inflammatory disease. We have, in such cases, the usual signs of inflammation of a serous membrane. When the affection is situated in the arachnoid, we have pain of the head, intolerance of light, perhaps squinting, and great quickness of pulse. In inflammatory dropsy of the pleura, we have pain in the side, dyspnœa, and cough. With respect to the pericardium, we have pain in the region of the heart, perhaps a rapid pulse, palpitation, and pain in the heart, darting from that organ in various directions. In the case of the abdomen, the pain is considerable, and is increased on pressure. In fact these are all so many *itises;*—arachnitis, pleuritis, pericarditis, and peritonitis. All these affections tend to induce more or less effusion in every case; but occasionally the effusion is very considerable; and then the word "*dropsy*" is applied to the collection.

The same occurrence takes place in the cellular membrane; and when it is in a state of dropsy,—that is to say, when it contains a preternatural quantity of fluid,—we have a white, soft, and inelastic swelling of the surface; which swelling pits upon pressure. The swelling may sometimes be red; because the skin may become inflamed, as well as the cellular membrane beneath. It sometimes is not soft, but intensely hard, owing to the high degree of inflammation of the cellular membrane, and the fibrinous nature of the effusion. The swelling, of course, is most considerable where gravity directs the fluid in the greatest quantity; so that any part which is dependent, becomes much more swollen in consequence; and you may regulate the swelling, by regulating the posture of the part. What is curious, the swelling will sometimes shift, independently of any particular position. Where a person is lying straight in bed, you will one day see one arm swollen, and the next day the other. Sometimes it will shift to the leg, and then return to the arm again. This is a remarkable circumstance, but one that does occur continually, without any connexion with posture.

When this dropsy of the cellular membrane is inflammatory, it generally occurs in the face, as soon as any where else; and I believe the reason is, because it generally arises from cold, and the cold is as frequently applied to the face as any where else. Usually, when these collections take place, wherever they may be seated, the urine is scanty; but, when the cellular membrane is the seat of the affection, and the affection is of an inflammatory nature, it is very common to see the urine of its natural quantity;—nay, very frequently, I have seen it more than it should be. This inflammatory dropsy of the cellular membrane, more frequently arises from cold and wet, than from any other cause; whereas inflammatory dropsy of the

arachnoid, the pleura, the pericardium, and the peritoneum, may or may not arise from that source. I hardly recollect a case of dropsy of the cellular membrane, of an inflammatory kind, which did not arise from cold and wet; and with it you will usually have inflammation of some internal part; or, if not inflammation, an inflammatory state. If you inquire into the state of the head, you will commonly find that the patient says it is heavy;—perhaps he has violent pain there; but generally it is heavy. If you press the abdomen, you will frequently find tenderness; but, above all, you will find an inflammatory state of the chest. The patient complains either of pain in the chest or of cough; or if you listen to the chest with the naked ear, or employ the stethoscope, you will find either the sonorous or sibilous rattles of the bronchia; or you will find the crepitous rattle of inflammation of the air-cells. In most cases of this inflammatory dropsy, you find inflammation within the chest.

The pulse, in dropsy of the cellular membrane, is frequently hard and full; and it is from the occurrence of the local symptoms of inflammation in the head, chest, or abdomen; from the strength of the pulse; from the suddenness of the occurrence of the dropsy; together with the nature of the causes which have produced it, being such as produce inflammation;—it is from these circumstances that you judge the disease to be of an inflammatory kind. For, although the affection is so decidedly inflammatory, you will not find the cellular membrane tender. It certainly is not painful;—patients, in general, do not complain of pain, when you press the surface of the body. Yet the inflammatory nature of the disease is sufficiently shewn, by the relief experienced on free bleeding, by the buffed and perhaps cupped state of the blood, and by the nature of the causes which produced the disease. The local inflammation that exists within the head, lungs, or abdomen, may generally account for the buffy state of the blood, and the relief that is experienced by bleeding; but when you find the dropsy itself cease so rapidly as it does after bleeding, it is impossible not to believe, that the dropsy itself was of an inflammatory kind.

In some of these cases, the urine is of an albuminous character;—that is to say, it contains serum; and we have been told that our guide for bleeding in dropsy,—that our guide in forming a judgment as to whether it is inflammatory or not,—is to be taken from the appearance of the urine. You will find it stated, in a work published by Dr. Blackall, that the quantity and firmness of the coagulum of the albumen, is usually proportionate to the existence of inflammation, and to the necessity for carrying into practice anti-inflammatory means. The albuminous state of the urine is shewn by heating it;—by putting some in a spoon, and holding it over a candle, till the temperature arrives at the point at which it coagulates. Or it is shewn by adding vinegar to it, and then prussiate of potass; when the albumen will, *after a time*, be precipitated. The former mode will do very well; but the latter is the neatest way. It is necessary to add the vinegar first; or you will not get the pre-

cipitate. Dr. Blackall says, that the firmness of the coagulum is usually proportionate to the marks of inflammation; but he says that, nevertheless, there may be albumen in an *opposite* state,—a state of debility; and in that case bark will cure the disease. His words are,—"A correct guide to venesection may be found in the firmness, copiousness, and early appearance of an albuminous coagulum in the urine; its *limits* in the improvement of the discharge of albumen in the urine, (that is to say, in the diminution of the coagulum), in the state of the blood, and the relief of the other symptoms."

Dr. Blackall has the great merit of pointing out an albuminous state of the urine, in many cases of dropsy; and of shewing that it frequently attends an inflammatory condition; but I am quite satisfied that if you take the state of the urine for your guide, you will practise very badly. It is to be remembered that it it a long time now since Dr. Blackall published his work; and it would be very strange if the practitioners who came after him had not improved our knowledge upon this subject. It is no reflection on any man who writes a work, that some of his opinions are proved to be wrong by those who succeed him. We go on adding experience to experience; and if any man who lived a hundred years ago, had luckily (or unluckily) lived to the present time, and had gone on making observations, he would have corrected much that he advanced at the beginning of his life. There is therefore no discredit in a man being proved wrong, in certain opinions he has advanced, provided a number of things he has asserted are true. I have certainly found it very common for persons to be cured of dropsy by bleeding, although no albumen could be discovered in the urine; while, on the other hand, where there has been albumen in the urine, persons have not been cured of dropsy by bleeding. Again, I have seen abundance of albumen in the urine, where there was such debility of the frame, as to forbid bleeding altogether. I should therefore advise you, in every case of dropsy, to determine the question, whether it is to be treated by bleeding or not, simply by observing whether there are inflammatory symptoms or not;—not to consider the state of the urine in the least; but to consider whether the symptoms are those of inflammation or not. If you find in any case of dropsy a full, strong, and quick pulse, with strength of body, you are then to presume that the case is of an inflammatory nature. If you find there is local pain, and other symptoms of local inflammation anywhere,—whether in the head, chest, or abdomen,—that is quite sufficient to determine the inflammatory nature of the case. Again, if you cannot learn much from these particulars,—if the pulse do not shew any phlogistic diathesis; and if the head, chest, and abdomen, are particularly free from inflammation, yet still if the disease have come on suddenly,—as inflammation often does;—if it is not the work of slow disease, like visceral affection; but has come on suddenly, and come on from the common cause of inflammation, (such as the application of cold and wet, especially

when the body is over-heated);—then the presumption is that the case is inflammatory; and you will not do wrong if you bleed, so far as the pulse will justify you; for the pulse will often *justify* this treatment, though it will not *point it out.* You must frequently have recourse to the pulse;—not to learn what to do, but to learn whether it will sanction you in doing what other symptoms indicate to be a proper procedure. Whenever dropsy comes on suddenly, from the application of cold and wet, and the pulse will justfy me, I certainly treat it as an inflammatory complaint. When the pulse is full, accompanied by a phlogistic diathesis, and signs of local inflammation, there can be no doubt about the treament of the case.

With regard to the albuminous state of the urine, we are indebted to Dr. Bright for the fact, that in organic disease of the kidney, the urine is generally in this albuminous state;—that is to say, contains serum. Andral, in his "Clinical Reports," had previously mentioned a case where he found the urine albuminous, and the kidney in a granulated state. He simply mentioned the fact; he had no more facts, and he came to no general conclusion, nor would he have been justified in doing so. But Dr. Bright has collected a large number of cases; and he has found that when the kidney is in a disorganized state, the urine is generally albuminous. He does not say, (so far as I can understand his book), that when the urine is albuminous, the kidney *must* be in a state of organic disease; for he says that sometimes he has seen it only gorged with blood. But still, even here, the kidney was *affected.* Some have gone farther than this; and I think without any reason whatever. They would have us believe that nobody can have albuminous urine, without organic disease of the kidney. Now really I cannot subscribe to this assertion; and for this reason. I have seen patients who were perfectly well a day or two before, but who have got wet through; symptoms of inflammatory dropsy have come on; the urine has become albuminous; but on bleeding them, the dropsy has presently been got the better of, and the urine has recovered its healthy appearance. Why these poor people should be supposed to have had diseased kidneys, merely because they had albuminous urine for a week, I cannot imagine. It is a mere assumption, I think. I could not open them, to ascertain whether their kidneys were diseased; but as they are in perfect health now, and had been in perfect health just before, and the urine is no longer albuminous, I do not believe there is any more foundation for supposing the existence of organic disease, than there is for supposing that cancer of the stomach is present in every case of temporary dyspepsia, because, when people *die* of dyspepsia, we find more or less organic disease. It is the business of those who make these assertions, to prove their correctness;—to prove that these persons have organic disease of the kidney, and not our business to disprove it; we have nothing to do with it. Because, when a person *dies* making albuminous urine, you always find structural disease of the kidney, it does not follow that, when the urine *temporarily* presents the same phenomenon,

and the person recovers, he has had any thing more than a functional complaint. Because the affection of the kidneys may arrive at such a degree of intensity, as to destroy life, and you then always find organic disease, it does not follow that the *temporary* formation of albumen in the urine, should be any thing more than a functional disturbance of the kidneys. I should draw just the opposite conclusion; and should suppose that, if the symptoms were temporary, the disease must be functional. Dr. Mackintosh informed me that some medical students in Edinburgh, had lately ascertained that when they ate pie-crust, and it produced dyspepsia, their urine became albuminous. They made this experiment over and over again; and the circumstance is nothing more than I should expect.*

It frequently happens, however, that dropsy is not inflammatory. You have patients exceedingly pale, with a pulse exceedingly weak, together with extreme debility of the whole frame; and the more you weaken them, the worse it is;—the more does the dropsy increase. Dropsy is frequently an accompaniment of organic disease in various parts. In disease of the liver, for instance, it is very common for the peritoneum to become the subject of dropsy. In disease of the womb, too, it is very common for the lower extremities to become œdematous; and this œdema at last spreads through the whole body, so that you have what is called *anasarca.* Œdema is a *local* dropsy of the cellular membrane; anasarca is a *general* dropsy of it. When we see no signs of inflammation,—no fulness of pulse (for there may be quickness without fulness), but, on the other hand, debility; and when you find the powers of the patient becoming exceedingly reduced, the disease must be put upon a footing with passive inflammation, or passive hæmorrhage, or a passive discharge,—a gleet from a mucous membrane; and every thing which debilitates the body will make the matter worse. This must be the case if there be any visceral disease; such as disease of the liver,—a liver full of tubercles, or indurated; or scirrhus, or carcinoma of the womb; or ulceration of the lungs. Dropsy, too, will sometimes be like hæmorrhage,—an entirely *mechanical* business;—not dependent on inflammation on the one hand, or debility on the other; but upon mere mechanical obstruction. Whatever compresses the large veins, will produce dropsy. The vessels become so turgid that, in order to relieve themselves, they let forth the serous portion of the blood; and if that be not sufficient, then the blood itself escapes.

In the treatment of *inflammatory* dropsy, we have above all to bleed, to purge freely, and to adopt low diet; and sometimes to give mercury. In this form of the complaint, we need not trouble ourselves about diuretics; any more than about astringents, in active hæmorrhage from a mucous membrane. If you treat the inflammation, you will generally find the collection of water gradually cease.

* Dr. Graves, the eminent Professor of the Institutes of Medicine, in the School of Physic in Ireland, has done much to dissolve the supposed invariable connexion between albuminous urine and disease of the kidney. He shows that it often depends on disease of the *liver.* See his valuable papers in the "Dublin Journal of Medical and Chemical Science."

However, sometimes it does not; and then it is well, when you give purgatives, to exhibit those which are called *hydragogue;* which cause very watery stools. That, in general, will answer every purpose. Purgatives are exceedingly beneficial, in cases of inflammatory dropsy; for they not only act as anti-inflammatory remedies (exactly as bleeding does, in diminishing the bulk of the fluids) by causing a rapid secretion of fluid with the intestines, and thus acting upon the cause of the disease, by tending to subdue the inflammation; but they act as palliatives, by causing the absorption of the effused dropsical fluid. It would be in vain to give diuretics in inflammatory dropsy; for they would not act during the inflammatory state of the system. Diuretics will not then act upon the kidneys; and the more you stimulate the kidneys, the less urine is secreted. But when you are giving hydragogue purgatives, you are doing the same as bleeding does; and, at the same time, you hasten the absorption of what has been collected; and in proportion as the inflammation is lessened, so do the hydragogue purgatives exercise more and more power over the kidneys. Among the best are elaterium and a mixture of jalap and cream of tartar.

If the dropsy be of *another* description, (such as I mentioned as being *without* any marks of inflammation), starving and bleeding will increase the collection ten-fold. Here you have to give wine, and perhaps good nourishment; together with steel, sulphate of quinine, and various diuretics. In this case the disease hangs on the patient so long, and such great inconvenience is felt from the collection of fluid, that, although diuretics will not *cure* the complaint, yet they are necessary for the purpose of lessening the quantity of fluid, which is collected in the body. Diuretics cannot go to the *cause* of the dropsy; they only tend to lessen the *effect* of the dropsy. Among the best are digitalis, calomel, squills, and acetate of potassa; and you will find it very useful to give these together. When you cannot increase the dose of digitalis, or squills, you may of the potassa; and so, by giving a great number of remedies, you do better than by trusting to one. We may give them to a full amount, by combining several together. The hydriodate of potassa, and all the other salts of this alkali, are strongly diuretic.

The effect of diuretics is very much increased by the exhibition of mercury. In inflammatory dropsy, mercury is highly useful as a remedy against inflammation; but, in the opposite kind, it frequently would do harm by increasing the debility, especially if there were much organic disease; but given in great moderation, so as to produce a slight affection of the mouth, it will enable the other diuretics to act much more powerfully on the kidneys. Though we sometimes succeed in curing dropsy, by putting a patient under a profuse ptyalism, when all other things have failed; yet generally that is not the case, unless the dropsy is in some degree inflammatory, or unless there is inflammation of some organ; but, in all cases, the moderate administration of mercury certainly makes all other diuretics answer ten times better.

When the chest is oppressed, and we find the patient in danger of being suffocated; or when the abdomen is distended, and the patient suffers great pain; or when the cellular membrane is distended, so that a patient cannot move about; and we cannot wait for the cure of the dropsy itself, or of its cause,—be it debility or obstruction, or any thing else,—it would be right to have recourse to means calculated to get rid of the fluid as soon as possible. In these circumstances, violent purgatives (such as elaterium) in full doses, answer better than diuretics; and for this reason;—they cause a greater discharge; and they frequently go to the *cause* of the dropsy; and remove some obstruction, some congestion, or some inflammation. But, of course, diuretics may be given with the purgatives, to increase the effect. It is found useful to give diluents at the same time; for diuretics are frequently so very acrid, that they irritate the kidneys, much more than is necessary for secretion; and their operation is much facilitated by the patient's drinking largely of diluents. The same is observed with respect to purgatives. They seem to operate a great deal better, if plenty of diluents be taken at the same time.

We sometimes find that patients are so oppressed with the fluid, that they cannot wait any longer. We find that our remedies do not remove it; and then we are obliged to have recourse to certain mechanical means for accomplishing this object. These are paracentesis of the chest, or of the abdomen, and (in cases of anasarca) the making of minute punctures in the skin, with a needle. Some persons scarify; but I am quite sure that every purpose may be answered with a fine needle. By making minute punctures in the skin, an immense quantity of water may be drawn away. There is no occasion to introduce the needle deeply; you have simply to put it through the skin, by rotating it between the finger and thumb; and when you withdraw it, you will see a bead of clear serum appear, which for a time will become larger and larger. It then trickles down; and the oozing will perhaps continue for some time. I have known it continue for days even after death. Twenty or thirty punctures may be made; and I never saw harm arise from the practice, when it was put in force above the knee. But although these punctures made with a needle are very minute, and the aperture is merely through the skin, I know that patients have lost their lives through them. I know that gangrene has taken place even through this slight operation; but in every case of this description that has come to my knowledge, the apertures had been made *below* the knee. It is an established rule in scarifying, to make the scarifications as high as possible towards the trunk of the body,—near to the most powerful parts of the body; and the same rule should be observed with respect to acupunctures. I have used them with great success all over the trunk, and upon the thighs, as low as the knees; and I have used them with equal success in all parts of the upper extremities; and I never met with any inconvenience. Be-

fore I was aware of the danger, I frequently used them below the knee; and never once did any accident at all dangerous occur to me. Gentlemen, however, have related to me cases which came to their own knowledge, where the operation below the knee was dangerous; where it was followed by sloughing of the skin; and, indeed, by sloughing of many muscles. One patient lost the gastrocnemii; and, at the end of two or three weeks, he lost his life. That is what no one would have supposed; but it certainly is the case.

These mechanical means are now and then necessary; but not so often as might be imagined, provided we treat the disease accordingly as it is inflammatory or not. If we carefully distinguish whether there is inflammation or not, we shall cure the complaint in a large number of cases. At St. Thomas's Hospital, when I have admitted a patient with the word "*dropsy*" on his letter, I have frequently been asked—"how I could admit such a case as that; since it was well known that dropsy could not be cured; and that Doctor Fordyce never admitted such cases." One of the greatest improvements in medicine, is that of distinguishing inflammatory diseases from those which are not so; and the establishment of the fact, that a great number of diseases are nothing more than so many inflammations. One half of the cases of dropsy which I see, are of an inflammatory nature; and yield to bleeding, and the other common remedies of inflammation.

It frequently happens, that inflammatory anasarca is united with inflammation of certain internal organs. Perhaps it is combined with an inflammatory state of the head;—not with decided phrenitis; but with heaviness, giddiness, and pain. Sometimes it is united with an inflammatory state of the abdomen; but, as far as I have observed, it is much more frequently combined with an inflammatory state of the lungs; either in the form of bronchitis (which is by far the most common), or of peripneumonia. The other kind of dropsy (which appears independent of inflammation), is sometimes united with, and is one of the last symptoms of, structural disease of an internal organ. It is very common, in disease of the heart, for example, for a person to become dropsical. In a large number of instances of phthisis, there is œdema of the legs, towards the conclusion of the affection; and when the liver, the uterus, or the spleen is diseased, dropsy is exceedingly common.

All these particular dropsies, closely resemble hæmorrhage and fluxes. You will recollect that hæmorrhage and fluxes, are frequently of an active inflammatory kind; and are to be treated, not by remedies calculated to arrest the flow of fluid, but by the remedies of inflammation;—not by astringents, but by antiphlogistic measures. On the same principle inflammatory dropsy is to be treated, not by remedies calculated to carry off the fluid, or stop up the mouths of the vessels which pour forth the secretion, but by remedies calculated to remove inflammation. You will find in hæmorrhage, that frequently there is no inflammation at all; but merely such a debilitated state of the vessels as allows the blood to escape from their ex-

tremities; and dropsy and fluxes frequently appear in that form. You will recollect, too, that hæmorrhage frequently arises under visceral disease. It is very common for persons with diseased liver, to have hæmorrhage from the nose; and in organic disease of the liver and spleen, persons will vomit blood, and discharge a great quantity from the intestinal canal. I need not say that, when various organic diseases produce ulceration, you may have the most frightful hæmorrhage. This is seen, every day, in the case of the intestines and of the uterus. So it is with respect to dropsy. You will recollect that, when organic disease takes place in various organs, the body at large, or one part in particular, may become dropsical; and the more you debilitate the patient in this case, (as in the case of passive hæmorrhage), the greater will be the increase of the dropsy; just as would be the increase of the hæmorrhage. In many cases of hæmorrhage, the flow of blood proceeds from mechanical obstruction; and the same occurrence takes place in dropsy. If great obstruction take place in any of the veins, dropsy must be the consequence. Local, and more or less extensive plethora takes place, in all the vessels on the other side of the obstruction; and, as a mere physical effect, the watery parts of the blood ooze forth from their extremities; and the part becomes more or less turgid, from the great congestion. You know there is every reason to believe, that the swelling of the leg after parturition, called *phlegmasia dolens*, depends upon mere mechanical obstruction. There is more or less dropsy of the leg; and it usually arises (as is proved by Dr. D. D. Davis and others) from obstruction. There is an obstruction of the veins at the upper part of the extremity; and perhaps also in the veins still higher up. The pressure of a very enlarged womb will often, in this way, induce dropsy of the lower extremities. In cancer affecting the axillary glands, or when the breast is attacked by cancer or scirrhus, you see an upper extremity become œdematous;—simply from mechanical obstruction. It is not necessary that the absorbents should be affected; for if the veins be obstructed, the same effect is produced. A local plethora takes place;—both of veins and capillary vessels. These pour forth a watery secretion; and you are sure to see dropsy at last;—simply as a mechanical effect.

In those cases of dropsy which are independent of inflammation, there may be organic disease, or there may not. Very frequently you have evidence of organic disease in the system, affecting particular parts. If it be phthisis, it is sufficiently clear; if it be disease of the heart, it is sufficiently clear; if it be disease of the liver, you may generally ascertain the state of the parts;—you find the liver enlarged or indurated, or both;—and the same with regard to the spleen. If, however, you can find no organic disease whatever, and yet there are no signs of inflammation; if the patient be evidently sinking under his dropsy, and the urine is albuminous;—I believe, in the greater number of cases (provided the urine is *constantly* albuminous), the kidney is diseased. It is generally found granulated, mottled, or labouring under great congestion of blood. You will

recollect that I mentioned, as my own opinion, that an albuminous state of the urine does not *necessarily* indicate organic disease of the kidney. I am satisfied that the patient may be labouring under mere functional derangement of that organ, of a temporary nature. But when you see a person sinking under dropsy, and the urine is albuminous, you may, in almost every case, expect to find more or less organic disease of the kidney. This is a curious circumstance, for the knowledge of which we are indebted to Dr. Bright.

With respect to the symptoms of these various dropsies, I shall mention them when speaking of diseases of different organs of the body; but with respect to anasarca, as that is a general affection, and therefore will not come under the head of diseases of particular organs, I mention the symptoms of it, and likewise the treatment, as well as of dropsy in general, in this place.

Anasarca will often exist alone. It frequently is an inflammatory dropsy; and when not, it will often exist without any evidence of organic disease; though after death we perhaps find the kidney diseased. But anasarca, as only one form of dropsy, often follows others. When a person has water in the chest, it is usual for the legs, and perhaps the whole body, to become œdematous. When there is effusion into the abdomen, it is very common for this *ascites* (as it is called) to be sooner or later followed by swollen legs; and at last the œdema may pervade the whole body, and become anasarca. The latter may exist alone, or it may follow others. Sometimes it is the first that begins; and then the other dropsies follow.

I did not mention any particulars for forming a prognosis, in cases of hæmorrhage, or in the case of the various fluxes; because the prognosis is only to be made by observing the degree of disturbance on the one hand, and the strength of the patient on the other. In dropsy, we must of course follow the same rule; but as dropsy, when it is not inflammatory, so frequently depends upon organic disease, our prognosis will depend, in a great number of cases of a chronic character, upon the evidence which there is of organic affection. We have also carefully to note, in giving a prognosis with regard to dropsy, whether, although the dropsy improves, some other symptom does not continue or get worse. Dropsy will sometimes diminish rather suddenly; and the patient, so far from being better, (although that is apparently the case), will die within a very short time. Sometimes, a short period before death, all the external symptoms of dropsy have diminished. Sometimes ascites will nearly disappear, or greatly improve at last; and œdema of the legs and the whole body diminish very considerably; and yet the patient will speedily die;—perhaps of apoplexy, perhaps of effusion into the chest. You must not be satisfied with the disappearance of any of the symptoms of dropsy. You must also carefully observe whether there are not still sufficient symptoms of mischief within, to make you fear the result of the case. Very frequently the severest symptoms may still exist; and may soon exhibit the most dangerous character, after a dropsy has spontaneously diminished.

With regard to the fluid of these various dropsies in the chest (the pleuræ and the pericardium), in the peritoneum, and in the head, it is sometimes perfectly clear; but more frequently it is at least turbid;—not transparent, though translucent. Sometimes it is very turbid indeed; and sometimes bloody. The fluid which forms the swelling, in anasarca, is perfectly clear; as is proved by the operation of acupuncture. If you make a minute puncture of the skin, with the point of a needle, (which is acupuncture), a bead of fluid follows, which is beautifully transparent. In the case of chronic dropsy within the head,—chronic hydrocephalus,—the collection of fluid is almost like rock-water. In chronic hydrocephalus, more frequently than otherwise, you find the fluid collected within the ventricles of the brain; and this fluid is very little different from pure water. It contains the least possible quantity of animal matter and salts. I believe the fluid of chronic hydrocephalus comes nearest to pure water, of any fluid that is morbidly collected in the body.

DEFICIENT SECRETIONS.

Some diseases are exactly the reverse of hæmorrhage, the profluvia, and dropsy;—being distinguished by a *deficiency* of secretion. In the height of inflammation, the secretion from the part may become scanty. Although it is increased at first, it will decrease afterwards; but still usually remains beyond the natural quantity. Sometimes, however, in inflammation, the secretion is at a stand. The secretions of the part itself, as well as the rest of the body, are diminished; and sometimes the part affected secretes hardly at all. This circumstance may occur, however, independently of inflammation. As with respect to violent discharges, so we sometimes have, independently of inflammation, a perfect deficiency of secretion. This happens, in a most remarkable way, in the case of the kidney. Old men will sometimes cease to make water, not from any *retention* of urine, but from a *suppression* of it;—the kidney ceasing, or nearly ceasing, to secrete. In *ischuria renalis*, as it is called, we have an instance of a case exactly opposite to that which occurs in profluvia. The treatment of this particular disease I shall, of course, speak of hereafter; I am now only speaking of these affections in general. We sometimes observe, on opening bodies, a similar state of the serous membranes. Sometimes the pericardium, and sometimes the pleura, is perfectly dry;—almost as dry as a piece of dried bladder. You will find this mentioned in many works on Morbid Anatomy. I do not know that this state induces any symptoms during life; but the state which is found after death, is precisely opposite to that which occurs in the affections of which I have just been speaking.

CHANGES OF STRUCTURE.

Inflammation sometimes produces changes of structure; and as I have spoken of those circumstances which merely affect secretion, or the escape of different fluids, I now proceed to those which affect the substance of the body itself. Changes of structure, though

frequently produced by inflammation, and frequently connected with inflammation, are sometimes (like hæmorrhages, dropsies, and the profluvia) *not* connected with it. They are, in the first place, changes of *consistence*, and changes of *size;* in the next place, transformations, in which the substance is changed in its *nature;* and thirdly, new formations, in which something new appears, totally different from what we see in the body naturally. Two, or even all three of these changes, may occur together. The first of which I shall speak, and which are more frequently the effect of inflammation than not, are changes of consistence, and changes of size. With respect to changes of *consistence*, I need not say that they can only be two; hardening on the one hand, and softening on the other. I shall first speak of induration.

INDURATION.

It is to be remembered, however, in the first place, that induration may be only apparent. An organ may feel much harder than natural,—may be really harder; and yet we are justified in saying that the hardness is only apparent. I will explain this. If there be extreme congestion in a part that can expand, it will become larger, and feel much harder than natural. If there be an obstruction to the flow of blood from the liver, though the liver itself will only be of its natural hardness, yet, in consequence of the obstruction, it will feel exceedingly hard; but, on liberating the blood, or making an incision, and letting the blood escape, it will come down to its natural consistence. This affection may be induced by an obstruction during life; and I believe that, the same thing may be induced after death, by a violent injection of fluid. We must therefore consider, when we see a part indurated, whether it is organic induration, or merely a state of great turgescence, or repletion, in consequence of an excess of fluid. When a part is really hardened, it is generally pale. Of course, if the hardness be merely dependent upon the collection of blood in the part, it will be of a deeper colour than usual; but if the part be organically hardened,—if it have undergone a hardening process, it is generally paler. Being more compact, you must suppose that, in general, the diameter of the blood-vessels will be less; and therefore there will not be such a proportion of blood as there was before. Sometimes the hardened part acquires a new colour. It may be grey, yellow, brown, or even black; but, for the most part, a portion of the body which has become indurated, is paler than usual. It does not follow, because a part has become indurated, that the size should be altered. You may have a part hardened; and it may be larger or smaller than before; or it may retain its natural size. We have every day instances of induration, in the case of a fistula along the side of the rectum, and in fistula in perineo. You may find here that the parts are all exceedingly hard. The heart is not unfrequently in this condition; for though this organ is more frequently affected in *size*, we not unfrequently find the heart hard. Even the general cellular

membrane is frequently seen hardened; and especially in young children.

This process of hardening is, for the most part, slow; and is generally the effect of chronic inflammation. Sometimes it does not occur till the inflammation is entirely over;—till the part has become pale, and there is no reason to suppose that inflammation exists; and then that process will take place, by which the part becomes hardened.

In the latter case, the affection is best removed by irritating the part. If the hardening be evidently attended by inflammation, antiphlogistic remedies are the best that can be adopted. Bleeding, both local and general, together with mercury, iodine, fomentations, poultices, friction, and pressure, are particularly proper. But sometimes there is no inflammation to be discovered; and then stimulation of the part answers much better than any thing else. It is also of great use to excite a discharge from the part itself, or close to it. It will frequently cause an absorption of the excessive matter which has been deposited. Occasionally, when there is no inflammation to be discovered, the treatment of induration becomes so irritating, that inflammation is set up; so that inflammation, although it may at first have laid the foundation of the disease, and produced it, yet afterwards has ceased; and then comes on again, as a third stage.

SOFTENING.

The opposite to this change of parts is softening; called by the French *ramollissement.* Indeed, many persons would not, for the world, use the word "*softening;*" but must ever employ the term "*ramolissement.*" However, it can mean nothing more in plain English than *softening.* Formerly this change was very vaguely described. Even induration was commonly described as a termination of inflammation, by the name of "*scirrhus;*"—scirrhus being confounded with simple induration; and as to softening, the subject has not been understood till of late years. It is to the French that we are particularly indebted, for our knowledge of that change of parts which consists in softening. This process is remarkably seen in the nervous system; and also in the alimentary canal. The mucous membrane of the stomach and intestines, is frequently reduced to a mere pulp, which you may brush off with a slight touch of the finger; and sometimes it appears to be brushed off even before death. In the case of the brain, we every day see that organ reduced, in certain portions, to a mere soft paste. It occurs, also, in the skin;—sometimes in the epidermis, sometimes in the cutis itself, and sometimes in the nails. We must all have seen the nails so softened, as to appear more like wet card than any thing else. This softening will affect the cellular membrane; and then it will allow the serous membrane without the intestines, for example, or the mucous membrane within, to be peeled off. If you can peel off the peritoneum from a portion of the stomach and intestines, it must be from the subjacent cellular membrane having become so softened,

that the serous membrane is no longer attached. So, if you can peel off portions of the mucous membrane, it must be from the submucous cellular membrane having become so softened, that it is no longer properly attached. The cellular membrane will sometimes remain solid, while all the other parts are excessively softened. This is seen in the case of the brain, for example, and of the spinal marrow. They shall become soft; while the pia mater (which corresponds with cellular membrane) immediately upon the brain, and immediately upon the spinal marrow, will be perfectly firm. A serous membrane, such as the peritoneum, will sometimes soften; as will also arteries, and even cartilage and bone itself. Bones may shew such a disposition to become softened, that one species of disease has acquired the particular name of *mollities ossium;* and in rickets,—another disease of the bones,—they are much below their natural consistence. The muscles, too, will sometimes become soft. After a person has been long exposed to the operation of lead in painting, I have seen the muscles become much softer than they should be; and so pale as to look like any thing but muscles. The heart itself, like other muscles, will frequently become soft. Sometimes you may push your finger through it parieties;—so excessively softened do they become. But every structure of every portion of the body may become softened. When parts are softened, they frequently retain their natural colour; but sometimes they are paler than they should be; sometimes they are redder; and sometimes they become brown and dark. You see there are great varieties with regard to colour; both when a part is indurated, and when it is softened. The colour may be unaltered; or it may be paler than natural (which I mentioned is generally the case); or it may be deeper than usual.

As with regard to induration, so with respect to softening, a part may sometimes be larger than it should be; or it may be smaller; and sometimes its bulk remains the same. You would not suppose that a part could be very rapidly softened; and yet it is certain that a part may be softened in a very short time;—at least, for myself, together with many French writers, and perhaps others, I feel satisfied that that is the case. It is mentioned by the French that a few days, if not a shorter time, are sufficient to produce a pulpiness of an organ, which before was apparently in a state of health. I think I have seen sufficient to make me believe that, in an acute disease, an organ (apparently sound before) may lose its natural firmness, and become a mere pulp, in a very short space of time.

Induration is generally the effect of chronic inflammation; and softening frequently arises from the same source. But I have seen a person in tolerable health suddenly, without any evident reason, fall into a state of the greatest debility;—with most complete prostration of strength; with no pulse; and in two or three days, some organ or other has been found reduced to a pulp. I had great doubts when I first noticed this, of the accuracy of my observation; but on reading the French writers, I found that they detailed cases

exactly similar; and that they came to the conclusion which I felt inclined to, though I was really almost afraid to make up my mind. When very rapid, I do not believe it is always the result of inflammation, or is even inflammatory; and when a slow process, I am sure it is not always inflammatory; for the parts are often exceedingly pale. In rickets, or in *mollities ossium*, what inflammation is there of the bones?

Induration, I have stated, may in certain cases be recovered from, by the remedies of inflammation; while in others stimulants will frequently remove it; especially if aided by mercury and iodine. But it is not known whether a softened state of a part can be recovered from. It is very doubtful whether this is the case. One would not think it possible if the portions be reduced to pulp. I also mentioned, that you are not to consider every case of *apparent* induration as *real*; for it may depend upon great congestion. From the presence of fluid, a part may acquire increased bulk and firmness. But softening cannot be merely apparent. If a part be soft, there can be no deception in it. You have, however, to guard against an error on this point. Softening may occur after death; and merely because, on a *post-mortem* examination, you find a part excessively softened, you are not to conclude that it was in that state during life. Parts will become softened from decomposition;—they will melt down to a reddish pulp. I mentioned, when speaking of redness, that a red appearance is sometimes mistaken for inflammation; whereas it may be only the effect of a red fluid which transudes, and encircles and dyes the part. Parts will become softened from decomposition. The brain, without any morbid state, very speedily becomes soft. Every body knows that if he wishes to dissect a brain well, he must have it fresh; that if the person have been dead any time, or the brain has been exposed to the air, it becomes too soft for accurate dissection. But the fluids within the body will themselves sometimes dissolve parts. There can be no doubt that the gastric juice will produce a softening of the interior of the stomach; and even do more than that. It will soften the whole coats of the organ; escape into the cavity of the peritoneum; and soften whatever it comes near. This was discovered by John Hunter; and I think we have sufficient proof of the accuracy of his observation. The appearances thus arising from the gastric juice, have sometimes led persons, who were ignorant of the fact, to imagine that a patient had been poisoned.

I need not say that, when softening occurs during life, it must produce some effect. A large number of cases of paralysis, depend upon a softening of the brain, or of the spinal marrow. Some cases of fatuity, likewise, depend upon a softened state of the anterior portion of the brain. Sometimes you have extreme debility, when any essential organ (such as the liver, the lungs, or the heart) becomes softened. Except in bones, and parts at or near the surface, the existence of this softened state cannot, of course, be well known during life. We only infer it as probable. If the part shew

signs of inflammation, the only treatment you can adopt is that for inflammation. You do not know that the part is softened; you only see that it is inflamed. In cases of paralysis, you cannot tell that the part is softened; but when you have symptoms of violent pain at one part of the head, and great heat, and the patient gradually becomes paralytic, there is a probability that the part is softened; but still you have no proof of it. If you see signs of inflammation, you must treat them;—without regard to softening or induration. If you see prostration of strength, you must endeavour to remove it;—not knowing whether the parts are softened or not. In the case of the heart, you may expect extreme feebleness of its stroke, when examined at the chest.

HYPERTROPHY.

The foregoing are changes with respect to *consistence;* we have others with respect to *size.* If a part really obtain an addition of substance, not dependent on transformation, or a new formation, it is said to be *hypertrophied.* This is a new word; but it is a very convenient one. The part suffers an excess of nourishment; it is therefore hypertrophied,—over-nourished. Hypertrophy may affect one elementary tissue of an organ only; or it may affect the whole of an organ together;—every tissue of which it is composed. It will sometimes affect the cellular membrane; and then this becomes thicker and perhaps denser than it should be. You may have a part over-nourished, without increasing in size. The excess may be such as merely to harden it; so that, in one sense, induration may be an hypertrophy. But, very generally, when a part is over-nourished, it acquires a considerable excess of bulk. If the cellular membrane be over-nourished, and at the same time indurated, you will see dead-white, or semi-translucent streaks along it;—white lines. Frequently portions of it, only, fall into this state of excessive nourishment. Tumors may be produced, which will cut like a turnip, and in which white and greyish fibres are seen. This is the character of scirrhus; and there is a doubt among those who cultivate morbid anatomy, as to whether this ought to be called a new formation; or is merely an excessive nourishment,—hypertrophy and induration,—of the cellular membrane. But however this may be, when the cellular membrane is thus affected, you see dead white, or semi-translucent lines;—white streaks, or white layers; and it may form a tumor in one particular spot. Sometimes the cellular membrane, in this state, will cut like lard; or like imperfect cartilage.

Mucous membranes are frequently hypertrophied. You will see the villi of the intestines very much enlarged; you will see the mucous follicles enlarged; and you will see the whole together much increased. The skin frequently suffers this change;—becomes excessively indurated and thickened. The brain will sometimes be hypertrophied, though I never saw but one instance of this affection. I have seen many instances of partial induration; and cases where all the brain was very firm; but there was nothing except a harden-

ing of the organ. In this instance, however, the brain had become larger than it should be. It caused the skull to be very much beyond the usual dimensions; and looked, on opening the skull, as if it had been ready to burst it asunder. The convolutions were all very large. This is a state described by many authors; and, for the most part, fatal disease of the brain is at length produced. This patient,—a lad, who was exceedingly precocious,—had a head larger than a man's. His character corresponded with that of an adult; and he suddenly became apoplectic, hemiplegic, and died. Nothing was to be found but an excessive size of the organ;—the brain, in other respects, being healthy.

The spinal marrow has been seen hypertrophied. Nerves will fall into this state after amputation. The nervous ends will become very large; and frequently there is a morbid sensibility. Muscles are sometimes seen hypertrophied; but the organ most frequently thus affected is the heart. The most common disease of the heart, is excessive nourishment of some portion; and that portion is, by far most frequently, the left ventricle. Blood-vessels, as well as the heart, will become hypertrophied; so that you have vascular tumors, filled with blood of course. On examining these tumors, you find nothing but a congeries of blood-vessels. Some tumors of this description, have been called *fungus hæmatodes;* but such an appellation leads to a confusion of terms. By *fungus hæmatodes* we more particularly understand a combination of this state, with a deposition of encephaloid (brain-like) substance. Blood-vessels are often hypertrophied accessorily.

When a part is over-nourished, there is usually, I said, an increase of bulk; but an excess of nourishment may go only to condensation; and then you may not have a change of size, but only of consistence; and sometimes an organ which is partially over-nourished, may be smaller than usual. It will sometimes happen, when an organ is composed of more tissues than one, that one tissue will entirely waste; and the wasting of the one, may more than counterbalance the over-nourishment of another. With respect to the cavity of an organ so hypertrophied, you may sometimes see it diminished, sometimes increased, and sometimes unaltered. That occurs in the case of the heart. Sometimes, if the heart be hypertrophied, the cavities enlarge; but sometimes the deposition of matter takes place outwards, and the heart really is enlarged, but the cavity remains much the same. Occasionally, however, the deposition takes place inwards; and the cavity becomes greatly reduced. When a part is thus hypertrophied, the consistence sometimes remains the same; sometimes it is increased; and sometimes it is diminished. There is just the same variation in colour. Sometimes the colour remains natural; sometimes it is paler; and sometimes it is heightened.

I believe that hypertrophy of a part is generally, more or less, of an inflammatory nature. Certainly, that is the case with the heart. Hypertrophy of the heart is, in most instances, entirely of an inflam-

matory nature; and indeed you must suppose that an excess of nourishment, must be the result of an excessive action in the part itself;—you must suppose that all the natural processes of the heart, are going on with tenfold vigour. If a certain operation be necessary to the continuance of nourishment, and it is much increased, you will have an excess of nourishment. It is impossible, in a great number of cases, to consider hypertrophy as any thing more, than a sort of inflammatory state. Excessive exercise of a part, however, will sometimes cause it to be over-nourished. We know that muscles will increase by exercise. A great excess of action in a part, will sometimes cause it to acquire a bulk, much beyond its natural dimensions. Still this is excessive excitement. It is *chronic* inflammation which causes hypertrophy; *acute* inflammation rarely does;—except so far as it lays the foundation for hypertrophy. Andral mentions that hypertrophy may sometimes arise from a defect of absorption; that the absorbents do not carry away the materials that they ought. An accumulation of nourishment takes place, without undue nourishment being deposited. This, however, is but a mere hypothesis. He calls it a want of de-assimilation;—the want of removal of those particles which are already deposited, and have served their purpose. When a part falls into this condition of hypertrophy, it is necessarily in a state of excessive activity; though perhaps without strength; and indeed no mark of inflammation may be discernible. Persons of the most sickly character, are frequently subject to this affection; as in those unhealthy parts of the world where bronchocele exists;—where the thyroid gland falls into a state of hypertrophy. Individuals in those situations are, for the most part, in a state of delicate health;—sallow,—shrivelled. So in rickets the ends of the bones enlarge very much;—they are hypertrophied; but the case is one of debility. In scrofula, we frequently see parts become enlarged. You see the ends of the fingers, in a case of decided scrofula, much enlarged; the mesenteric glands, and also the upper lip, are much larger than they should be; and yet such persons are not instances of strength, and of increased vigour. Indeed, in the most unhealthy districts, (the valleys of the Alps, for example), you have hypertrophy, not only of the thyroid gland, but also of the liver, the tongue, the bones, and the hand; and yet the persons are pale and emaciated, and no sign of inflammation appears. Hypertrophy may induce very serious effects in the case of the brain. I believe that sooner or later apoplexy, paralysis, or epilepsy, will ensue. In the case of the heart very great suffering is induced. You have palpitation from the slightest causes; you have generally a strong violent pulse; and at last you have dropsy.

The usual remedies for hypertrophy, are the general remedies for inflammation;—rest and low diet, with moderate and repeated bleeding. But occasionally you are not justified in these measures; and you must then support the strength. Of course, when this affection occurs in a cachectic habit of body, (as rickets, or scrofula, or the state of cretinism in the Alps), any thing that depresses the powers

of the body may do harm; and good air and good food are the best remedies

ATROPHY.

The opposite of hypertrophy is atrophy,—wasting. Sometimes the part which wastes, does not become smaller, but becomes thinner than usual. Its bulk may be the same; but its texture may become lighter,—more spongy than usual. Atrophy sometimes affects the whole of an organ; sometimes only a portion, or a tissue; and sometimes the part will become thinner and thinner, till at last it is perforated. Parts that waste away are generally softer, and frequently paler than natural. Atrophy of parts is commonly induced by inflammation, or by violent irritation. The excessive nutrition of neigbouring organs, will frequently cause one to waste;—the excessive action going on in one, causing the actions of the other to decline. A wasting away of the testicles, frequently supervenes on inflammation which has followed the mumps. Andral mentions that, after suppuration near the liver, he saw the gall-bladder waste away entirely.

Atrophy is frequently an effect of bad air; of bad food; of depression of mind; of deficient exercise. As we must consider hypertropy in general to be *excessive* function, so in atrophy there is diminished action,—a *deficiency* of function. As it is usually the very opposite state of things from hypertrophy, very opposite remedies are usually required. So far from the part being allowed to be at rest, it must be well used if possible; and must also be stimulated as far as may be.

TRANSFORMATIONS.

I now proceed to consider those changes, in which one structure is converted into another structure, natural to the body. These are called *transformations*. Though of a diseased character, they are like those which naturally occur, during the growth and decline of an individual in health; or else they are such structures, as the particular part is actually found to be naturally of, in some of the series of animals. For example,—cellular membrane is the frame-work (if I may so speak) of the other structures of the body; and in the natural condition of the body,—in its natural progress, we observe that when a part is no longer wanted, it degenerates into cellular membrane. An instance of this is presented to us, in the thyroid gland of the fœtus. Now such a change will occur merely as a diseased process. A part may be resolved nearly into cellular membrane; and that is an instance of transformation. Cartilage will sometimes, by disease, become bone; but it is perfectly natural to the progress of the body, that cartilage should become bone in the fœtus; for before bone we have cartilage. Thus the morbid changes which are transformations, are nothing more than alterations, precisely the same as those which happen naturally in the progress of the human body; or they are alterations of a part to a structure, which it is seen to be of naturally, in some other animals. Although

they are morbid processes, they observe exactly the same law as those which are natural. One structure is not changed into another, unless that same structure is observed to be naturally changed into that other, at some period of the progress of the body; or unless that other is the natural structure of the part, in some of the series of animals. Cartilage, I have said, will become bone through disease; and the same is observed as a natural process at certain ages; whereas it is never known that, by any disease, a mucous will become a serous membrane. As such a change is unknown in physiology, so it is unknown in pathology.

Mucous membranes may be converted into skin; and skin may be converted into mucous membranes; muscles will also degenerate into fibrous membranes. Now the very same part which is mucous membrane in one animal, is skin in another; and what are muscles in some animals, are merely fibro-ligamentous substances in another. These same changes, however, will occasionally take place out of their natural course, through disease; and they are then called transformations. Cartilage, on the other hand, is never known, in physiology, to become mucous membrane. What is cartilage in one animal, is never mucous membrane in another; and in the transformations which take place in the progress of the human body naturally, cartilage never becomes mucous membrane. So in disease, cartilage is never known to be converted into a mucous membrane.

Now as to these transformations, almost all the structures of the body will waste into *cellular membrane*. It is, perhaps, hardly right to say they are *transformations* into it; because cellular tissue of the body, is the frame-work of all the other structures. Indeed, it has been said that, if all the various other substances were absorbed, and nothing but the cellular substance remained, (provided it could be kept firm), it would maintain the entire form of the body. Parts often appear to be transformed into *fat*. But Andral considers that this is merely an instance of inordinate secretion of fat, with or without atrophy of the tissues.

We have frequently a transformation to *serous* membrane. When the extremity of a bone has been dislocated, you will find, after a considerable lapse of time, that a serous membrane is formed round it. If a coagulum of blood be effused into the brain, or any other firm substance deposited there, (even if it is a bullet), it will become surrounded by a serous membrane,—a *capsule*, as it is called; which secretes serous fluid. Occasionally, when there is a loss of substance, which nature cannot entirely repair, the space is enveloped by a serous membrane. Even when a portion of substance is deficient,—not by external violence, but by a natural defect,—its place is frequently supplied by a serous membrane. In a defect of portions of brain, you will find in their room a bag, containing liquid; which bag is, to all intents and purposes, a serous membrane. What are called *apoplectic cells* in the brain, are nothing more than cavities formed by a coagulum of blood which has been effused; and which

coagulum has had a serous membrane formed around it. The coagulum will be absorbed, while the serous membrane may remain, and continue to secrete fluid.

Such serous cysts may be formed in almost any part of the body. You know that a serous membrane is a closed sac, with a smooth internal secreting surface; and that it is found in the body naturally. Precisely such serous sacs are formed by disease; and are of all sizes, from that of a pin's head, and even (more minute still) from that of a millet-seed, to a very considerable bulk. We find these cysts sometimes placed in juxta-position, either attached or unattached to each other; and sometimes they are closely united to the surrounding parts. They may be single or they may be numerous,—solitary or crowded. Generally there is no red vessel to be traced beneath the external surface; and the utmost vascularity is an arborisation upon this. The part which surrounds these cysts, may be in all sorts of states. Usually it is perfectly healthy; sometimes it is wasted; and sometimes it is in other states of disease; as, for example, indurated. Occasionally we find these serous cysts surrounded by pus, or some other secretion. They are frequently surrounded by cellular substance, which gives them an additional coat; sometimes they become indurated,—even to cartilage or bone; and sometimes they become more or less fibrous. You will recollect that the cellular membrane becomes very firm, round the fibrinous cup of an abscess, and gives it an additional support; and so it is with respect to these serous cysts. The cellular membrane around them, is frequently condensed.

The internal part of these serous cysts, presents very various appearances. Occasionally, and, indeed, for the most part, it is smooth,—exactly as in a natural serous membrane; but it varies just as natural serous membranes do when diseased. When natural serous membranes are diseased, they are frequently rough, granulated, or flocculent within; and so the interior of these adventitious serous membranes presents a great variety of appearances;—being occasionally rough, with minute granules; and sometimes with large caruncles, as it were. The granules which adhere to the interior of these serous cysts, are frequently of an osseous character; or contain, at least, more or fewer particles of bone. Occasionally we observe false membranes lining the interior of cysts; that is to say, fibrin has been poured out; giving them exactly the appearance which you have in inflamed serous membranes, and which I spoke of formerly. There are frequently partitions in these cysts, dividing them into so many compartments. Frequently there are prolongations from the interior, running through the cavity of the cyst, and not completely dividing it; but causing it to have a number of compartments, communicating more or less with each other.

You will find the *contents* of these new serous membranes very various, as well as their internal surface. Occasionally they contain merely a serous fluid;—occasionally they contain blood. They will contain something like mucus;—various saline matters, fatty matters; tubercular matter; and some things which are peculiar to cysts.

There is a far greater variety in the contents of these serous cysts, than in those of the natural serous membranes of the body, when the latter happen to be diseased. You may find different substances in different portions of the same cyst. You may also find some cysts growing from the inside of others,—hanging in them by peduncles; and sometimes, instead of hanging in this manner, they are attached to the interior by a flat surface of considerable extent.

It has been imagined that all the new formations of the body are originally nothing more than cysts; and these cysts have been called *hydatids*. The term "hydatid" should be confined to a certain animal; but it is used vaguely to embrace not only real animals, but also these serous cysts; which are nothing more than morbidly formed serous membranes. Now it has been imagined that all the new formations of the body were originally hydatids;—that is to say, either parasitic animals, or such new cysts as I have mentioned. One compartment of these cysts, it is true, will sometimes be filled with scirrhous matter, another with melanotic, and another with encephaloid; and we continually see minute serous cysts by the side of schirrus, melanosis, &c.; and hence it has been supposed that these are merely different stages and forms of the same disease. But I do not see any proof of it; for when a part has once fallen into a state of disease, all kinds of disease will frequently spring up around and in it. It has been supposed, where we cannot detect any new serous membrane, but where we see the solid substance of scirrhus, for example, that it was nothing more originally than a serous cyst, filled with indurated substance;—that the transverse bands are nothing more than new serous cysts, which grew on the inside, and hung by peduncles; and which became filled with an indurated substance, until the whole formed one mass;—that the fibrous bands we see in scirrhus, are nothing more than different serous cysts, all compacted in this way. You should consult, on this subject, the works of Dr. Baron;* and a paper by Dr. Hodgkin, in the "Medico-Chirurgical Transactions."† Their views are ingenious; but whether altogether true, I will not pretend to say. Dr. Hodgkin followed Dr. Baron; and, as far as I can comprehend his paper, has only developed Dr. Baron's views.

You will understand, then, when you see minute sacs in various parts of the body, that they are usually nothing more than new serous cysts. You will see them continually in the choroid plexus in the brain; and you will see them from the most minute size, till they attain a very considerable magnitude.

With respect to the transformation to *mucous* membranes, when a natural mucous membrane is destroyed, it is very common for nature to supply a new one. This is, of course, not always a disease;—any more than inflammation is always a disease. When a fistula takes

* "Inquiry, illustrating the Nature of Tuberculated Accretions," (1819); "Illustrations of the Inquiry," &c. (1822); and "Delineations of the Origin and Progress of various changes of Structure," &c. (1828).

† Vol. xv.; page 265.

place by the side of the rectum, or in the perineum, it will acquire a lining membrane of a mucous character. Even in an old purulent cavity, you will sometimes see a lining of this character. In the lungs, when an abscess takes place and does not heal, but remains for a considerable length of time, the internal secreting surface acquires the character of a mucous membrane.

When a new mucous membrane is formed in the lungs, you will sometimes have a cavity exist for years; and both the fistula and the cavity will be lined by something like mucous membranes. In all instances of this newly-formed mucous membrane,—formed through disease, although by a restorative process,—you will find it to be one of the most simple character. You will never see a new mucous membrane so perfect as that of the intestines;—it will never exhibit such villi. In its utmost state of perfection, it will be only like the mucous membrane of the urethra. The urethra presents one of the most simple specimens of a mucous membrane; while the mucous membrane of the intestines, presents an example of the most perfect description.

If a mucous membrane be exposed to the atmosphere, it acquires all the characters of *skin*. As I before stated, skin and mucous membrane may be always classed together; but if a mucous membrane be completely exposed to the air, so as to be dried, it becomes exactly like skin. You will often have an opportunity of seeing this, in the instance of prolapsus of the womb. When the womb falls through the vagina beyond the external opening, and there remains,—is not kept up by art, you will find the vagina become dry, shrivelled, and pale,—exactly like skin; and I presume that if it were allowed to remain there permanently, you would hardly be able to tell the difference between it and skin. When the skin is destroyed, it may be reinstated by fresh skin.

Conversion to *fibrous* membrane is very common; and it is the cellular membrane particularly, which undergoes this process. The cellular membrane will become indurated, so as to form cords; or so as to form a continuous membrane of a fibrous character; and frequently we have it indurated and accumulated into a mass. In all these cases fibres may be seen; and in the midst of these fibrous bands may be observed cellular membrane, not yet perfectly changed. You may also have tumors consisting of fibrous membrane, or of cellular membrane yet imperfectly converted into fibrous; and you may have them pretty uniform throughout,—homogeneous; you may have them in lobes; or again, in granules. Sometimes they will become a little vascular, and sometimes *very* vascular; —differing exactly as we see various *natural* fibrous membranes differ. They are more or less firm, according to the change which has taken place. Sometimes you may tear them to pieces; and sometimes you may reduce them entirely to pulp; but they are exceedingly hard occasionally, and you cannot do this. The structure surrounding one of these tumors, is often perfectly healthy; but sometimes it will be actively inflamed, and sometimes it will waste away. These

tumors will occasionally take place after accidental inflammation; and sometimes they will occur without any obvious reason whatever. We sometimes see that, after the cellular has, in this way, been converted into a fibrous membrane, it becomes still harder; and forms cartilage, and even bone.

The transformation to *cartilage*, is also a very common morbid process; and takes place exactly under the same circumstances as the conversion to fibrous membrane. Very often it succeeds it; and is present with it. What becomes fibrous membrane at first, will often become cartilage afterwards. Cartilage, if of diseased origin, is very often formed of cellular membrane in the substance of organs; and frequently between the different tissues; so that it is common to see it under a serous membrane. When you see the pleura, or the pericardium, cartilaginous or ossified, it is the cellular membrane immediately underneath the serous membrane, that is converted into bone. When cartilage is formed in this way, it is sometimes in mere little points, and sometimes in patches. This is a very common occurrence in arteries. You will see spots in the interior of an artery, of a different colour from the rest,—excessively firm,—of a cartilaginous character; and these are formed under the lining membrane of the artery. Cartilage is frequently formed like a fibrous tumor,—in lumps; so that you have hard knobs. It is very common, after chronic inflammation of a serous membrane,—when the whole is thickened together,—to find a knob of cartilage here and there. Serous cysts frequently have knobs of cartilage in different parts; and frequently they are cartilaginous to a great extent. These knobs are found in the substance of different organs; but I believe they are for the most part cellular membrane, extending most frequently from the surface into the substance, and there increasing in size.

You will sometimes see new cartilage loose in a cavity. It is very common to see it in a joint; and it is not uncommon to see it in the veins of the pelvis. I believe it is formed under the synovial membrane, in the one case; and under the lining membrane, or inner coat of the vein, in the other. It protrudes, till at length it has a peduncle; which peduncle becomes thinner and thinner, till the whole is detached; and then you have a loose cartilage in the joint, or in the veins. I sent to the University a specimen of the veins of the pelvis, in which were a great many cartilages, which you could move about from one portion of the vein to another, like peas. Transformations to fibrous membrane and to cartilage, so frequently run into each other, that you have fibro-cartilaginous transformations.

Induration, however, proceeds frequently farther than this. The natural change of cartilage into *bone*, is continually observed to take place in disease. After cartilaginous transformation has existed for a long time, you frequently find bone produced. It is said that the cellular membrane, fibrous membrane, and cartilage, are strictly and positively the only parts of the body that are ever converted into bone; but whether they are so or not, they are the parts which by

far the most *frequently* are so converted. The loose cartilages which I mentioned, as frequently existing in the veins of the pelvis, frequently become bone; so that you have hard bony substances loose in these veins; and these go by the name of *phlebolites*,—vein-stones.

When bone is deposited, the deposition may take place in the form of minute granules, so that the part is rough; and in this way you frequently find it in the valves of the heart. Or it may be deposited in the form of scales;—a character in which you frequently see it in the interior of arteries. When the radial artery is slit up, you frequently find bone deposited in minute scales, which you may pick off from the interior; and sometimes it forms continuous plates. I shewed you a kidney which had been converted into a bony cyst. There was a *continuous* deposition of bone. This is a proper word; because the bone is deposited in a continuous manner, like membrane; but it would be wrong to say *membranous*. Sometimes it is deposited irregularly,—in an *amorphous* manner.

It is sometimes deposited abundantly, forming very considerable masses. You will occasionally, in encysted tumors, find a lump of bone larger than a walnut; or perhaps as big as two walnuts. I have seen at least two or three instances of it. Bone thus deposited is sometimes homogeneous. If you cut it, it is without fibres,—without any reticulated portion at all. Sometimes you have it harder than natural bone. Sometimes it has rays or cross fibres, like diploe, with an external compact substance. You see an instance of nature's highest efforts and powers in forming new bone, in necrosis; where a deposition, to a considerable extent, takes place under the periosteum; and which deposit will become a perfect bone surrounding the old one. Diseased formations of bone are found to consist of phosphate and carbonate of lime, and of some animal matter;—just like healthy bone; but the proportion of phosphate and carbonate of lime is exceedingly various; so that you rarely find two cases of bone formed by disease, in which the proportion of the two is the same.

These are the chief observations which it was necessary for me to make on transformations. When structures are so converted, we say it is a *transformation;* and that it is into an *analogous* structure. That is to say, the structure which is produced, is analogous to a natural structure;—to a structure seen somewhere or other in the body during health. But besides these, we have *new formations;*—not formations newly made, (that is not the meaning of the term);—but formations of a new character;—something which is new to the body, and which is altogether of a diseased character. These are called *non-analogous* or *heterologous* formations.

NEW FORMATIONS.

The chief of these, of a solid kind, are *tubercles*, such as are seen in scrofulous cases; *melanosis*, which is a formation of black substance; and sometimes a yellow substance, called *cirrhosis*. Besides

these, we have certain saline substances produced, which are unknown to the healthy body. For example, when speaking of calculi, we shall find a substance called *xanthic oxide*, and another called *cystic oxide;* substances unknown to the healthy body. Some of the liquid products of inflammation (pus, for example) are unknown to the healthy body. The secretion of serum and of lymph, in inflammation, may be compared to analogous transformations. They are liquids subsisting in a healthy body; although their appearance in the part is unhealthy;—at least, their quantity is unhealthy. But we have a substance produced in inflammation, that is unlike the natural fluids of the body;—is a *new formation*, and of a liquid character;—namely, pus. So that, you see, there is an analogy running through all these things. In inflammation we have the liquid products of the part increased. For example,—from a mucous membrane we have secreted more mucus than natural, and of an unhealthy quality; and from a serous membrane we have serum produced in abundance; so that these may be compared to those changes of structure, in which there is merely an alteration of size and consistence, and in which the part becomes hardened or enlarged. Again, I mentioned that there are some diseases in which there is a *deficiency* of secretion;—as, for instance, *ischuria renalis*, and dryness of the skin; and these may be compared to softening and atrophy of substance, where there is a deficiency of matter. Then again, we have, in inflammation, liquids secreted which are foreign to the part. For example, we frequently have lymph secreted; and though that is a fluid natural to the body, yet it is not natural to the part; and these secretions may be compared to those changes of structure, in which one part of the body assumes the character of another part; such as the transformation to cartilage or bone. Then, in inflammation, we have pus produced,—a new liquid; and (as I shall presently mention) in some diseases, a semi-fluid substance, like jelly; which substance is called *colloid*, from being like jelly. Sugar is sometimes formed in the urine; as well as the cystic and xanthic oxides, just alluded to. Cirrhosis, melanosis, tubercle, and encephaloid, are new solid formations. All these are called *non-analogous* or *heterologous;*—being heterodox matters. Now some of these formations may be organized;—they are *organizable*,—if such a word may be used. Scirrhus, for example, is of this description; fungus hæmatodes, as it is called, or encephaloid tumors, may also be organized; but tubercular substance cannot be organized. Scrofulous tubercles may become bone; but more frequently they are softened down, and pus is seen; but they are not substances capable of being organized, and forming part of the body.

TUBERCLES.

I shall begin the consideration of new formations with tubercles. The word "*tubercle*" has been employed in a vague sense. It is used by one person in one sense, and by another person in another; but there is now a great tendency to limit it to a scrofulous deposit.

All small tumours in the substance of organs and serous membranes, or indeed upon the skin, have been called, and are still called *tubercles;* but the French have adopted the custom of restricting the word to tubercles of a scrofulous character; and it is in that sense in which I now wish to speak of it.*

A scrofulous tubercle is of a yellowish white colour; and is usually round. It varies from the size of a millet-seed, to that of a nut; and it is sometimes even still larger. It is firm, but friable; for although it is tolerably hard, yet if you take it between your finger and thumb, you find it will break down;—unless it have been converted into bone; and then, indeed, it is no longer a tubercle. Its character is curdy or cheesy; and it softens down into a substance, which is non-analogous to the rest of the body. It softens down into a sero-purulent fluid; but in this fluid you still have the friable tubercular substance, forming flakes within it. When the matter is let out altogether, you see a curdy substance floating in it. When a tubercle softens down, the liquid of course has a tendency to escape, like the matter of an abscess. An abscess is formed, which either increases or remains stationary for a time; and at length, when it is discharged, there is an attempt on the part of nature to heal up the part,—to produce cicatrization. These tubercles not being an organized substance, and not being organizable, must increase by juxta-position;—exactly as stones would do, or any thing else inanimate.

It is supposed by some that a tubercle is liquid at first, and becomes harder afterwards. I should suppose that every thing in the body, when first secreted, must be liquid. One cannot conceive that vessels will pour forth solids. They all appear destined to hold liquids, however short a time the matter may remain so after its escape. It may, perhaps, become hardened immediately. Neither do I suppose that any thing can be absorbed but liquids. It is the opinion of Cruveilhier, an eminent morbid anatomist, that tubercles are liquid at first; and Andral, an equally industrious and sound morbid anatomist, entertains the same opinion. Although they become of a yellowish white colour, yet they are at first greyish, and semi-transparent; and the semi-transparency gives a farther reason for supposing, that they are originally formed liquid. It is clear that they do undergo changes;—first having a transparency, and then becoming yellow; and we may suppose that there are more minute changes still; but changes which occur at too early a period, to render it possible for us to discern them.

They soften down, it is said, by a deposition and secretion around them, penetrating and breaking them up. But I am not myself satisfied that this is a true account; because we find them continually softened in the very centre, without any liquid which could

* Tubercles in all their varieties,—the forms which they assume,—the changes which they undergo,—together with the opinions of the French pathologists as to their nature,—form the subject of a paper (to which the reader is referred) in the thirty-eighth volume of the "Edinburgh Medical and Surgical Journal."

have got into them. We find them firm externally, and liquid within. I should therefore suppose that the softening of the tubercles was really a chemical change; and their not being organized forms an additional argument in favour of this opinion. If there be a deposition of external liquid matter, which goes into them, certainly the external part ought to be softened down as soon, at least, as the interior; but they generally soften at the centre. However, it is not invariably that they are softened down at the centre; for they will sometimes soften in other parts, especially upon the surface. When they are softened down, an abscess is formed; and the tubercular matter escapes. It is very common for fresh tubercular matter to be deposited within the cavity, after the discharge of the contents of the same character.

When tubercles are not softened down,—when they are firm, they are found to consist chiefly of animal matter; with some muriate of soda, phosphate of lime, carbonate of lime, and traces of oxide of iron. This, however, matters little. It is right to ascertain these points as far as possible, in the hope that it may lead to some important discovery hereafter; but still we do not yet understand their nature better, by understanding of what they consist. Some have an exceedingly firm cretaceous earthy matter. Of course, the same substances are found in all of them; but in proportion as they are firm, do the phosphate and carbonate of lime abound, compared with the other materials. Dr. Carswell has made some beautiful drawings representing tubercles in all their various stages; as well as numerous specimens of transformations and new formations; such as ossification of the trachea; an ossified cyst; ossification of the valves of the heart; and an ovarian tumour containing bone; for teeth, and even hair, have sometimes been found in tumours of this description.*

Now these tubercles are seen almost every where;—you may find them in almost every part of the body; but they are more frequently found in free cellular membrane, or in the cellular membrane which is a component part of different organs. Besides these situations, they are found in the liver, in the brain, in the kidneys, in the testicles, and in the lymphatic glands. They are also found in the air-cells of the lungs, and in the parieties of these air-cells; and they are found also in the lymphatic vessels themselves.

In adults they are by far most frequently found in the lungs; and next to the lungs, in the small intestines. In 350 adults with tubercles in various other parts of the body than the lungs, Louis, the celebrated French pathologist, found only one whose lungs were free from them. When tubercles exist in adults, therefore, they are most frequently found in the lungs; and next to them come the small intestines. Speaking still of the adult, after the small intestines

* We must refer our readers to the splendid series of pathological plates which Dr. Carswell has published. It is entitled, "Illustrations of the Elementary Forms of Disease. With coloured Figures of the natural size, and descriptive Letterpress. By R. Carswell, M.D., Professor of Pathological Anatomy in University College, London."

comes the mesentery in point of frequency of this affection; so that all other parts stand at a very great distance from the lungs, with regard to the frequency of tubercles in them. The intestines and mesenteric glands stand at a certain distance from the lungs, in point of liability to this disease; but all other parts stand even at a greater distance from them. So great is the tendency to them in the lungs, that Louis has made the calculation I have just stated. The liver is a part in which scrofulous tubercles are less frequently found than in any other; but they are by no means uncommon in the spleen, particularly in infants. In infants, it is very common for other organs than the lungs to contain tubercles, while the lungs remain free; which is just the reverse of what is observed in adults. In infants you more frequently find many organs affected at once than in the adult; in whom nothing is more common than to find them only in the lungs. In infants, too, the proportionate frequency of tubercles in different organs, is not the same as in adults. The frequency does not pursue the order of lungs, intestines, and mesentery; but follows quite a different rule. For example, they are far more frequent in the spleen, in the mesenteric glands, (or, as they are called, the mesenteric ganglia), and in the bronchial ganglia. They more frequently affect those three parts, than the lungs; and they are much more frequently found in the nervous centres (the brain and the spinal marrow) of infants, than of adults. They are very rare, however, in the fœtus during its first months; but about the fourth year, they become far more frequent; though they are not then very numerous. From the fourth to the fifth year they are found to be very frequent; and attack many organs at once. So frequent are they in children at this period of life, (at least in Paris), that Lombard says three-fourths of them perish from tubercular disease; or, at any rate, there is a tubercular deposit found somewhere or other, after death. After this age they become less frequent, till the period of puberty; though they are still more numerous than before the fourth year. From the fourth to the fifth year, as we have said, they are very frequent; then they decline for a time; but still they are more frequent than before the fourth year. It is found that children are more free from tubercles during the second year, than at any other period before the fifth.

Tubercles are said to occur in men chiefly from the age of 21 to 28, and in women especially before the age of 20. In men they appear later than they do in females. They are not confined to the human subject: they continually arise in brutes. I believe that, both in this country and at Paris, monkeys generally die of tubercular disease; and tubercles are found in a large number of their organs. They occur also in horses, pigs, cows, rabbits, hares, sheep, and birds. It is said that a great number of the parrots which die at Paris, have tubercles. Parrots, like monkeys, come from a warm climate; and become affected by the coldness and vicissitudes of such latitudes as Paris and our own. It is said, but I do not pretend to know much of such matters, that they are not found in dogs.

The predisposing cause to tubercles, certainly appears to be a want of proper food, and a want of proper external temperature. If an animal be kept in the dark, and likewise in a damp situation, so that it is exposed to cold and damp, and particularly if it be fed on not very nutritious food, you may in many instances produce tubercles at pleasure. I believe that the great and almost the only cause of tubercles, in the human subject, is the want of good food, and of a proper external temperature. Exposure to cold and moisture, and particularly, perhaps, *alternations* of temperature, will produce tubercles. When the disposition to them is once produced, it becomes hereditary; and you see children, with every comfort around them,—well fed and well clothed,—become, at a certain age, the victims of tubercular disease. The disposition, when once established, certainly becomes hereditary; but, without any hereditary predisposition, thousands and tens of thousands die of tubercular disease, from exposure to cold, united with moisture, and the want of good food; and in all probability, in a great measure, from vicissitudes of temperature. However, the influences of these causes may be much diminished by good food;—by keeping up a good fire within, we suffer much less from an external low temperature. It is food which is required for this purpose; not mere stimulants, such as spirits or wine. These will not answer the purpose. It must be a good nourishment; which maintains a slow but constant fire (if I may so speak) within; and does not give merely a temporary excitement, which always increases the injurious effects of a subsequent low temperature. This subject, however, will be particularly spoken of when I come to the treatment of pthisis; which is the great tubercular disease of this country.

This tubercular deposit acquires an enveloping membrane, and frequently two. Sometimes you see no lining membrane; sometimes the deposit takes place in a diffused manner, and it is said then to be infiltrated; but in the lungs you, more frequently than otherwise, see the tubercular deposit surrounded by a membrane. You will see a regular capsule; and in the interior of this capsule, you often find a softer membrane, which may be easily peeled off, while the external one is frequently pretty tough. When it is formed, tubercular deposit may remain for years without injury; but if the deposition be very great, it forms a source of irritation. If a great quantity be deposited in different parts, (and often, indeed, where the deposit is trifling), the surrounding substance falls into a state of irritation; the tubercular substance softens; and that process takes place which I have already mentioned.

The cavity, when the matter is discharged, is for the most part irregular. It is not of a definite shape, but irregular. Its parieties generally grow harder and harder; and you frequently see the tubercular substance not entirely discharged, but adhering pretty firmly to the sides. These cavities frequently have sinuses communicating with the external surface, or with the large bronchial tubes. When the tubercle has been near the surface, (which is very common

in the case of the absorbent glands), the ulcer has generally a flabby edge, which is turned inwards;—the very reverse of what takes place when an ulcer is cancerous; and it often heals up perfectly well. Even in the case of the lungs, we shall see that occasionally such cavities do certainly heal.

These tubercles are attended by no pain, so far as the deposition itself is concerned; but the irritation around is frequently a cause of pain; and if a tubercle be near the surface of the lungs, the pleura generally falls into a state of inflammation. There is more or less pleuritis; and the person suffers pain in the side. When a tubercle is producing much inflammation around, of course there must be the usual signs of inflammation. In the case of the glands of the neck, there is considerable pain when active inflammation is excited.

The disposition to form these tubercles, is called a scrofulous habit of body; and the person is said to labour under scrofula or struma, when labouring under such deposits as these. The marks of a constitution so disposed are, generally, a fair and fine skin, fine soft hair, a dilated pupil, and a large upper lip; and it is observed that, when the internal parts labour under scrofula,—not the external parts, but the internal viscera,—the extremities of the fingers and thumbs, and even of the toes, become enlarged. It is a remarkable circumstance, but it happens in a great number of cases of phthisis, and certainly in scrofula of many other parts,—such as the liver, and the mesenteric and lymphatic glands,—that the ends of the fingers become enlarged. I presume that a faint scrofulous inflammation attacks the last joint. Many persons, however, are scrofulous, who have neither a fair skin nor soft hair; but on the contrary a dark complexion. But still they look pale, and have dilated pupils and a tumid lip; and perhaps are pock-marked. Those more particularly disposed to it, however, certainly have a fair skin, a pulse disposed to be quick, and elongated fingers. When the disease, however, becomes established,—when tubercular matter is deposited, you see the ends of the fingers enlarged; so that the nail is prominent. It is like an acorn,—exceedingly convex; and the last joint altogether becomes broad. This disease, as I said, may undoubtedly be hereditary; and is so in a very large number of cases. It is a disease that attacks persons of all ages; but particularly in the early parts of life; while the disease of which I am now going to speak, is rarely seen in the young,—rarely seen before the middle period of life; and generally not until after the middle period is past.

SCIRRHUS.

In scirrhus it appears that there are two changes;—there is a *transformation* and a *new formation*. It would appear that the cellular membrane of the affected parts becomes exceedingly indurated, and is changed into a hard fibrous membrane; but in the midst of this there certainly is a new deposit, of a particular description. When scirrhus takes place, you will see a firm, exceedingly hard, unequal, irregular mass. It is of a light greyish colour at

first; and if cut into thin slices, it is semi-transparent. If you examine a section, you see a large number of fibres traversing morbid structure in different directions; and between these there is a substance less white than the rest. The deposition constituting tubercles is inorganic; it is not a new *organization*, but a new *deposition*. In scirrhus there is a transformed structure, at any rate; and besides that, there is an inorganic substance, deposited between the fibrous portions. These fibrous portions, running in different directions, form septa,—divisions; and you see they are opaque and paler than the others; that is to say, of a more dead white: in fact, a scirrhous tumour cuts exactly like a turnip. In a turnip you see fibrous septa, running in different directions; and a softer less white substance between them. The septa, in scirrhus, run in every direction; and sometimes are seen to form regular cells. The proportion of less hard substance between the fibres, is exceedingly various; and the mode in which the fibres are distributed, is likewise exceedingly various; so that you may sometimes have a mammary tumor, sometimes a pancreatic tumor, and sometimes a tubercle;—that is to say, a tumour something like a mamma, or something like a pancreas, or something like the tumour of scrofula;—you may have a tubercle, in the common acceptation of the word.

The less hard substance at last undergoes the same process, as a true scrofulous tubercle. It softens down into an ichorous fluid,—into something like jelly or gum; and the process here begins usually,—perhaps always, but at any rate usually,—in the centre; as is generally the case in scrofulous tubercles; the centre having been originally the hardest part. The skin above becomes puckered, or retracted; and its colour also becomes changed. It assumes a leaden, or livid hue. At first, the whole tumour is moveable; though it will not allow the whole of the fingers to be placed under it;—it will not allow the edge to be turned up. But, after a time, it forms adhesions to the neighbouring parts, and becomes immoveable.

CANCER.

Ulceration takes place in a scirrhus mass, exactly as in the case of a scrofulous tubercle; and when the ulceration begins, that state of things is called *cancer*;—schirrhus being the first stage (the stage of induration); and cancer the second stage (the stage of softening and ulceration). In this form of ulcer, the edges are everted and elevated;—you see the edges much raised, irregular, and turned out. The surrounding cellular membrane undergoes the process of suppuration. Now and then we see a sort of fungus sprouting up from the ulcer;—a hard gristly fungus. The centre of such an ulcer is deep; the discharge is generally very fœtid; and great irritation is produced. Sometimes, instead of a simple suppuration around, we have sloughing; and now and then nature succeeds in throwing off the whole mass;—the scirrhous tumour has not formed adhesions to the surrounding parts; but suppurates, or rather

sloughs out. The lymphatic glands, to which the absorbents of such a tumour run, generally become contaminated. They generally become indurated,—scirrhous; and undergo the very same process as the original part.

This is a disease which in general primarily affects those parts which are not necessary to life. It affects glands, the functions of which have been interrupted, or have never been performed; it affects the breasts,—particularly when a woman is past child-bearing; and it particularly affects the breasts of women who have never had any children. It also, where there is any predisposition, particularly affects parts which have suffered mechanical injury. Many women have had cancer in the breast after a blow, who in all probability would not otherwise have suffered. It particularly affects the breast, the uterus, the ovaria, the testes, and the thyroid gland; none of which parts are necessary to life; the breast, uterus, ovaria, and testes, being all for the sake of the next generation, and not for the sake of ourselves;—except, indeed, as a gratification. The thyroid gland is, of course, a part unnecessary to life. When, however, it has existed in these parts, it affects others secondarily; and then we find the lungs, liver, omentum, mesentery, spleen, pancreas, brain, the medulla of the bones, and the skin, become the subjects of the affection. Now and then it may affect these parts primarily; but as a general rule,—and one can only speak generally,—it only affects the parts which I have now mentioned secondarily. When it affects the skin primarily, which it now and then does, a sort of wart is the first thing which appears; and it becomes cancerous. If it affect the skin only secondarily, then I believe more generally you have a tubercle, in the common sense of the word;—a little hard lump. For example,—when the breast has been affected with cancer, the skin in the neighbourhood will become the subject of *tubera;*—little hard scirrhous lumps. We certainly often see cancer affect the cardia, the pylorus, and the rectum primarily; yet although it sometimes does so, it is by no means so frequent an occurrence, as the affection of those particular organs which are not necessary to life, and whose functions may cease without the body at large suffering. When it affects the alimentary canal, it attacks particularly certain portions, which form divisions of it. For example, it affects the lips, which are the first part; next to them it will affect the fauces, and the cardia;—the lips forming the commencement of the mouth, the fauces of the throat, and the cardia of the stomach. Then it affects the pylorus,—the commencement of the intestines; and then, again, it affects the rectum; which is the termination of the canal. It is a curious fact that it is generally the *apertures* of cavities that are affected. We shall see, when we come to consider diseases of the heart, that it is the openings which suffer, far more than any other portions of that organ.

Speaking of secondary cancer, it has been observed that, when the breast has been the subject of this disease, the bones often become affected. They become flexible, and easily break; and the fracture

discloses a bloody mass in the medullary cavity. The affection spreads around; so that muscles, cartilage, and bone, are all blended together into a cancerous mass. You will find a paper on this subject, by Mr. Salt, in the fifteenth volume of the "Medico-Chirurgical Transactions."

This disease is attended in general, almost from the first,—from the very earliest stage,—with severe pain;—pain that is sharp, lancinating, and of the most dreadful kind. The pain certainly does not depend upon inflammation; for it will occur where no inflammation can be discovered. When the stage of irritation has arrived in which there is inflammation, sloughing, and suppuration, the irritation is so great, that the whole constitution suffers materially; and the skin acquires a peculiar sallow tint;—a sort of pallid yellowish straw colour. This state of the body is decidedly cachectic; that is, the whole body is in an unhealthy state. Andral ascribes this sallow appearance to a change which the blood undergoes;—the constituents of the vital fluid being absolutely altered. There is a sallow look, by which any experienced person will suspect, that the individual is labouring under some malignant disease. This has been called *cancerous cachexia;*—"*cachexia*" meaning a bad habit of the whole body.

I mentioned that the diseased part sometimes sloughs out; and the person recovers. That, however, is so rare a circumstance, that even if the surgeon remove the disease, the relief is but too often temporary; for, in the greater number of cases, the disease re-appears, either in the same neighbourhood, or in an opposite part. It would appear that it depends, in a great number of cases, upon some constitutional tendency; and all that art can do is to remove those parts which have fallen into a diseased state; but as the tendency remains in the constitution, persons generally show the disease again, sooner or later, in some other situation, or around the spot of the operation. This disease, like scrofula, may be hereditary;—I mean, of course, the disposition to it; and it is not known (at least, as far as I am aware) what circumstances give a predisposition to it. Those which give a predisposition to scrofula, are evident enough; but I am not aware of any circumstances, which are known to give a predisposition to scirrhus and cancer. Unquestionably, the disposition may be hereditary. I have known many persons die of cancerous disease, one of whose parents had previously died of the same affection. You will find several drawings by Cruveilhier, illustrating the various stages of this affection.*

ENCEPHALOID DISEASE.

The next disease of which I shall speak, is one which differs from scirrhus and cancer, in affecting the young rather than the old. It is what is called *fungus hæmatodes*, or *encephaloid* disease. It has

* "Anatomie Pathologique du Corps Humain; ou Descriptions, avec Figures Coloriées et Lithographiées, des diverses Altérations Morbides dont le Corps Humain est susceptible."

been called *encephaloid*, because the deposition is not hard, like scirrhus, but to a certain extent resembles the brain. It has also been called *fungus hæmatodes ;* because, when it arrives at the stage of ulceration, a fungus, of a bloody character, sprouts out; and, on cutting into it, you see large distinct cells filled with effused blood. It is, therefore, like brain in some parts, and is bloody in others. The deposited matter is like brain; but in the cells in which the deposition takes place, hæmorrhage continually occurs; so that blood is effused there, and a coagulum forms. There is a great disposition to hæmorrhage, in this disease; but the deposit itself is an opaque, whitish, homogenous substance; and may be compared, in colour and consistency, to cerebral pulp. There is an excellent representation of the affection, by Dr. Carswell; taken from cases in which it was situated in the brain and liver. I have opened many brains and livers, containing tumors about the size of a walnut; which, on being cut into, presented a homogeneous brain-looking pulp. There is often nothing like the firm fibres of scirrhus;—no distinct white bands ramifying in the tumor; but a mass such as I have just described. When exposed to the air, it softens down,—just as the brain will do; and it may be washed away, leaving a filamentous texture. If you take a tumor of this description, and expose it to a stream of water, you may wash the pulp away; and then you see an exceedingly fine filamentous structure, which has contained the opaque brain-looking substance; but then this structure is not hard, like scirrhus, but exceedingly fine and delicate. The consistency of encephaloid substance varies, from that of a soft custard, down to the firmest part of the brain when perfectly fresh. One portion of this is sometimes pinkish; and sometimes portions will be as red as a clot of blood; but if the blood have been effused in great quantity, then you have regular clots of blood. You will frequently find various portions differing in colour, size, and consistency; and some are even cartilaginous;—that is to say, I presume there is a double formation,—a double disease; and that scirrhus is united with it. Now and then you will see bony particles. It occasionally happens that portions of what is usually a fine filamentous membrane, become converted into an indurated substance, like cartilage; and now and then there are little deposits of bone; for many of these structural diseases are all blended together. Sometimes you see portions of it in a regular cyst. Instead of fine filaments containing this brain-like matter, you see absolute cysts; and sometimes you see portions resembling the white of boiled eggs, —coagulated albumen. This deposit, as it grows, softens down; and, like scirrhus and a scrofulous tubercle, it generally softens first in the centre. When it softens down, cavities are formed; or perhaps we might say cavities become discernible. These cavities then chiefly contain blood; and on washing this away, you see filaments or shreds floating in the cavity. If a portion of it be near the surface, the skin grows discoloured, the tumor adheres to the subjacent parts, and increases in size; or if the tumor be situated within, the

serous membrane above it grows thin, till it gives way; so that the tumor may ulcerate through the surface; or a serous membrane within may give way.

When the tumor ulcerates, a fungus shoots forth; but it is not firm,—like the fungus of scirrhus; but, on the contrary, is soft, easily torn, and bleeds very much. It is irregular, and of a dark red colour. When the fungus is very small, it exactly resembles the red soft polypi which grow from a mucous membrane. It grows very rapidly, and pours forth a fœtid sanious fluid; and people sometimes die, not from the irritation of the tumor, but from hæmorrhage. I had a patient who died from hæmorrhage, occasioned by one of these fungi in the bladder. There was, in the interior of the bladder, a fungus as large as a walnut, which never gave him any pain, or produced any irritation to the constitution; but which bled in spite of every thing which could be done. He discharged, not only bloody urine, but pure blood; and at last sunk under it. The hæmorrhage from a fungus of this description is often very copious. Now and then portions will slough.

This is a disease which affects every part of the body. It will affect the testicle; and then it is called by some, *soft cancer of the testicle;* or it may affect the breast, the eye, the uterus, ovaria, spleen, pancreas, liver, urinary bladder, brain, mesentery, and bones. It is very common in the eye of children. It is continually seen in the extremities; and the absorbent glands become contaminated, as they do in the case of common cancer. When the glands are affected, and you make a section, they disclose nearly the same appearances as the original tumor; but there is this difference, it is said,—that they never send forth a fungus.

You frequently have in the neighbourhood smaller tubera,—circumscribed, but without a capsule; varying from the size of a pea to that of a walnut; of a pale greyish colour; and firmer than the original tumor; but they are the same disease. This is a disease which commonly affects other organs secondarily; so that when persons have it in the breast, it is very common to find them gradually become the subjects of cough, and pulmonic disease; and, on opening them, you find similar tumors within. It is said that the organs which are affected secondarily, are never affected primarily;—it is so said. It is very common for many organs to become affected at once; and so great is the disposition to this disease, when there is any disposition at all, that Mr. Travers says he has never known a person survive four years, in whom he had operated for the extirpation of the disease. The constitution becomes impaired. There is a cachetic look, even earlier than in scirrhus. Usually the person becomes emaciated, but now and then there is hardly any irritation at all; and you will sometimes see a person die of this disease in the stomach, without having suffered any pain at all; and frequently without any person having suspected the nature, or even seat, of the disease. With respect to the case I mentioned of the disease in the urinary bladder, the man, although he died from the

hæmorrhage occasioned by it, never suffered the least pain. Even when the mass is very considerable, there is generally little or no pain; and sometimes there is little or no irritation of the constitution. The case differs, therefore, from schirrus very materially in another respect. Schirrus, I mentioned, is almost always attended with violent deep lancinating pain; whereas, in encephaloid disease, there is very little pain,—frequently none; and sometimes there is very little irritation.

A tumor of this description is exceedingly soft. Its external appearance is remarkably smooth and equal; and it gives you the idea of fluctuation; so that I have known surgeons of great experience deceived, in cases of this nature. They have imagined it was a collection of fluid, and plunged a lancet into it. I have seen this mistake occur over and over again;—from its extreme resemblance, with respect to the touch, to a tumor containing fluid. Frequently, for a length of time, the part will not be at all discoloured. It is soft and elastic; and it is these two circumstances that give you the idea of fluctuation. The tumor, when taken out, is generally more or less round; and (as I stated before) it differs from scirrhus, in occurring at an early period of life. You saw a kidney, taken from a child six years of age, in which several portions of disease were of this nature. It seemed to be a mixture of various diseases;—some portions were scrofula; some were of scirrhous hardness; and in other parts there was certainly fungus hæmatodes.

I do not know what gives the disposition to this disease. I am not aware of any external circumstances, which cause persons to be more liable to it; nor do I know whether it is hereditary. It is very probable that the disposition to it is hereditary,—exactly like the disposition to scirrhus; but it is carefully to be remembered, that this is not a painful disease, like scirrhus; and that it is a disease which affects the opposite period of life, to that in which scirrhus particularly prevails. Some consider it to be a mixture of scrofula and cancer.

MELANOSIS.

The next new formation of which I have to speak, is called *melanosis*, or *melanodes*; in which is deposited a mass of black substance; which, if cut, gives an unctuous smooth section; either uniformly dark-coloured, or presenting certain shades; so as to be mixed up with patches, or streaks of paler coloured substance. Sometimes it is deposited in lobules, or a mass; and sometimes in plates. If you macerate a mass of this description, the black portion is seperated; and this readily mixes with water, and stains the hand, linen, and paper;—just like Indian ink. It has neither taste nor smell. I never tasted it myself; but this is said to be the case; and it is worthy of notice, for considerations which I shall presently mention. It resembles in every respect the pigmentum nigrum of the eye, or the dye of the cuttle-fish; and the colouring matter of the hair, of the skin of negroes, of some parts of the brain, the bronchial glands (or

ganglia of the lungs) of old people, and the placenta of some carnivora, may be similar. When you have washed it out by water, the structure which is left after the separation of the black substance, is circumscribed; and is more or less firm. When I say *circumscribed*, I am supposing that you take a piece of an organ; that you wash the part that is healthy, and thus wash out the black portion; and then there will remain a circumscribed substance, more or less firm, different from the rest of the organ in which the black matter lay.

Although the character of this disease is blackness, yet you do not always have a decidedly black colour. There are shades of brown, and even of a yellow hue, as well as the black. The masses, or depositions, are not only of all sizes, but also of all shades. Sometimes a black mass of this description, is thought to soften down; but that must be a rare occurrence. You have seen that scirrhus softens down; and that tubercles soften down; but this very rarely, if ever, softens. It is of course, a totally inorganic substance. It is like a tubercle in this respect,—that it never becomes organized; but it is unlike a tubercle in rarely, if ever, softening. A dark-coloured fungus will sometimes arise, from the part in which this black deposit has taken place; and so far it resembles fungus hæmatodes. The neighbouring glands will become affected;—at least, when I say the neigbouring glands, I mean the glands which are connected with the absorbents of the part. Sometimes we have melanoid tubera, or tubercles (using the word "tubercles" in its common acceptation);—melanoid deposition in remote organs, so that the disease appears (like fungus hæmatodes or scirrhus) either in a primary or a secondary form;—beginning in one part, and being found afterwards (though not of course in so advanced a stage) in distant organs. There appears to be an analogy between this disease and fungus hæmatodes, as to the organs which are primarily and secondarily affected. There is the same order observed with regard to both circumstances. You might sometimes commit a mistake, when you see an absorbent gland, or a ganglion affected with this disease; for you might take it for a mass of melanotic substance. The absorbent glands frequently have this substance deposited in them; and become blackened; and of course it is a gland blackened with a secretion of melanotic matter, and not a real mass of new matter, which is there. If you do not consider that the part which you are examining, is one in which an absorbent gland actually lies, you might sometimes mistake a mere blackened gland, for a mass of this peculiar melanotic matter.

This is a disease which does not occur early in life, like fungus hæmatodes; but rather resembles scirrhus in this respect;—seldom occurring till the individual has passed the middle age. It has been seen, like the other deposits, in brutes; and particularly in the horse. Of all brutes, I understand, it is most frequently found in the horse; and it is said to occur most frequently in cream-coloured and spotted grey horses; and oftener in horses in the south of Europe than here. I do not speak from observation of my own; for I have not

dissected many brutes; and I am not willing, of course, to intrude upon the province of other persons; but I presume there can be no harm in speaking incidentally in this way. So large are the masses which sometimes occur in horses, that they have occasionally been found, in the abdomen, to weigh thirty pounds. It is likewise seen in dogs, cats, rabbits, mice, and rats;—so curious have some people been, in the investigation of melanosis. It not only attacks so many creatures, but it is said to attack all parts of the body;—chiefly, however, the lungs and the liver. Dr. Halliday mentions an instance of most intense melanosis in the human subject; where it existed, almost universally, in the subcutaneous and inter-muscular cellular membrane,—in the cellular membrane under the skin, and among the muscles; in the peritoneum; in the pericardium, the pleura, the ovaria, the sternum, and the bones of the cranium;—so extensive sometimes is this deposition.

Sometimes, though rarely, this substance (I do not use the word "*matter*;" because that conveys the idea of pus) is enclosed in a cyst. Most other deposits have a cyst; but it is only sometimes that this is found to be so enveloped. Occasionally, instead of being collected into a mass, it is completely diffused;—not merely in small scales and plates, but *generally* diffused along a membrane, mucous or serous; and I presume, when this is the case, it really is deposited, not upon the membrane itself, but rather in the cellular membrane immediately underneath it. I should imagine so, because it is the cellular membrane that is liable to become cartilage and bone, and which is particularly liable to other diseases. This disease, too, is not unfrequently seen in new membranes of the body;—I mean false membranes. When a serous membrane has been inflamed, or has had lymph deposited which has become organized, then the false membrane becomes cellular membrane, as I mentioned before; and these new false membranes are sometimes seen to contain a melanoid deposit. However, it is said to be sometimes found on the surface of a serous membrane. It is right I should mention that I have not seen it; but it is said to have been found, not *underneath* the membrane, but lying on the surface. The parts around probably do not undergo any change except softening. Around this black deposit, the real natural parts of the body are found softened; but in general that is all, unless this disease co-exists with another; and it is a very common thing for it to co-exist with scirrhus, with fungus hæmatodes, and even with tubercles. Where, however, it exists alone,—where it is conjoined with no other disease, it seems to occasion nothing more than a mere softening of the surrounding parts.

Occasionally this same substance would appear to exist in a fluid form. Occasionally we have a cyst filled with a liquid perfectly black; in which no difference has been observed from the mass I have now described, except that the one is liquid and the other solid. When this melanoid matter has been found in a fluid state, there is every reason to believe that it was formed originally fluid,

and not softened down; because the usual course of the disease is for the mass to remain solid, however long it may last. When we see black fluid contained in a cyst, therefore, we must conclude in general, that this substance had been originally formed with a disposition to remain fluid.

Now we continually see upon a serous membrane, spots of melanosis; that is to say, perfectly black spots, which appear to be quite analogous to this affection. Indeed, one can hardly open many bodies, without seeing these spots upon certain serous membranes; particularly the peritoneum towards the pelvis, the uterus, the bladder, and the rectum. These appear to do no harm; they are perfectly innocent deposits; and sometimes we see very extensive deposits, superficially diffused; and in persons who are known not to have suffered at all from that circumstance.

It is frequently seen in mucous membranes, after they have been injured. After a mucous membrane has ulcerated, and has healed, (which is very common in the intestines), the cicatrix is frequenly blackened, more or less, with a deposit of this description. The deposition, as I mentioned before, is sometimes not exactly black, but merely greyish;—sometimes brownish, or even yellow; and this we see in the skin after an eruption, and after ulcerations of various kinds. After an eruption, the skin will sometimes remain black, but more frequently brownish; and after an ulcer, it is very common for the legs to remain of a dark colour,—sometimes black, but more frequently of a brownish yellow. These, I presume, may be considered various shades of a similar deposit. The same is seen in the brain, after paralysis from effusion of blood into its substance. A deposition of this sort is sometimes seen in the mucous membrane of the intestines, after chronic diarrhœa. Occasionally, in the intestines, you see points (not so large as a scale) of black deposit; as if a very fine powder had been sprinkled, in the finest possible way, upon the surface of the intestines. I do not know that it indicates any thing particular; but, every now and then, you will see such points extensively disseminated. When I first saw this, I imagined it was some dirt or soot; but I found that I could not wash it off. It is not any thing exactly *upon* the surface; you see it *through* the surface; but you cannot rub it off, unless you destroy the membrane itself. I have sometimes seen the middle of the tongue of a jet black, without any unhealthy state of the rest of the organ; and without sordes, or any dangerous symptom.

I think there is a very curious circumstance analogous to this. I have never seen it; but there are, perhaps, nearly twenty cases on record within my reading, (and beyond it there may be far more), of white persons who have become black. A change will now and then take place over the whole of the skin; so that a white person shall become entirely black. I have seen portions of the arm become black; but I have never seen an extensive change of that kind throughout the body. Others suppose (and I coincide with them) that this is a malanotic disease, on a very extended scale;—that

melanoid substance is diffused solely upon the skin, and in the most extensive manner. When we consider that if the disease be formed in a mass, it always bears a resemblance to the pigmentum nigrum of the eye, we must suppose that when a white person is converted into a black, it is nearly the same affection.

Persons occasionally discharge from the stomach, or the intestines, a black liquid; and the discharge of this is called, in old authors, by the peculiar name *Melœna*,—the black disease. This stuff, when perfectly black, has (I believe) no smell; at any rate, when it happens to be discharged pure, without fæces, it has no smell; and cases have been noticed, in which a large collection of precisely similar black liquid matter, has been found in the peritoneum. Some such cases are upon record. I know that Dr. Prout has seen two or three instances, (though I have not seen any myself), in which the urine was perfectly black;—not bloody, but black. The black secretion of the bronchia, in some people, is probably dependent on the same dye. When we come to consider yellow fever, we shall find that persons vomit stuff of a black colour, which is called *black vomit*. It is found to be tasteless; so that some have indulged themselves in drinking it. Others have put it into their eye, to see if it were acrid; and others have made an extract of it, and formed it into pills, and taken several in the course of a day; and they all concur in stating, that it is just like the melanotic matter which I have just spoken of, as deposited in solid masses;—tasteless, inodorous, and perfectly innocent when taken into the stomach.

I believe, with respect to the discharge from the intestines, that you may have it entirely black, or a little reddish,—so that you observe a slight hue of red in the black. Indeed, you may have it of various kinds, down to absolute blood. I think that these discharges which take place from the alimentary canal, are blood that has undergone a certain change. Persons are exceedingly exhausted by this black discharge; but as it comes away through the intestines, it produces no pain, and (in general) no irritation;—nothing but exhaustion. It is admirably remedied by small and frequent doses of oil of turpentine;—just like hæmorrhage from the same parts. It appears to be (and I believe we must look upon black vomit as similar) an exceedingly mild substance;—as nearly like the blood as possible, except in colour. What the change is that has been undergone, I do not of course pretend to know; but the black urine, the black discharge from the intestines, the blackness of the skin when a patient is converted, partially or generally, from white to black, the blackness on the peritoneum, and of the mucous membranes, of cicatrices in various parts of the body, and the black masses and substances in various organs,—all appear to be the same affection in different forms, and in different degrees; and it would appear (in many instances at least) to be merely blood which has undergone a very slight change. As taken from the horse, it is found, by analysis, to contain the elements of the blood,—fibrin, albumen, &c.; but nearly one-third is a highly carbonized substance,

probably altered cruor. Every other constituent is in far less proportion. In the cells of the ovaria, we often see a black substance, —frequently blood; and all shades may be traced between the two; so that blood here appears capable of being changed to this black substance.

Melanosis appears to be perfectly harmless, except from the quantity of the substance which is formed. There may be an inconvenience arising from its bulk, its pressure, and its hardness; and of course when it is discharged, in a liquid form, there may be exhaustion from its quantity; but independently of that, I believe that the disease is not one of any malignity. Still it is to be remembered, that it is very frequently united with malignant disease; for, in a mass of fungus hæmatodes, you will often see a black deposit. This is not to be wondered at, when you consider that, in fungus hæmatodes, there is blood effused into the different cells. It is also seen in scirrhus, as well as encephaloid disease; and you continually see all these diseases mixed together in the same individual;—scirrhus, melanosis, and encephaloid disease, in one mass; but when confined to itself, I believe it is thought, by the greater number of persons, not to be a malignant disease.

KIRRONOSIS.

There is a disease, in which a substance is deposited of a yellow colour, in spots or patches, in the substance of the viscera, or upon the skin, or upon different membranes. A German author (Lobstein) says, that he has seen various parts of a membrane so coloured; and he calls this affection *kirronosis*. It seems particularly to affect the membranes of the head, chest, and abdomen; and when jaundice occurs in young children, Andral imagines that it is really this particular disease, and not true jaundice. I can give no opinion about it. There is a species of jaundice which occurs in young children, and which is speedily got rid of by castor oil, or even if no measures were adopted, would often cease spontaneously in a day or two; but besides that, there is sometimes jaundice, the disposition to which is congenital; for many families have died of it in succession. There are many children who are said to have jaundice; but which affection is supposed to be an instance of this yellow disease. Laennec calls it *cirrosis;* and says it is deposited in masses, or layers, or sometimes in a cyst,—such as we occasionally see in melanosis; and he conceives that a hard tuberculated liver, such as is seen in gin drinkers, is an instance of this affection. I recollect having once seen, in the liver of a child who had scrofulous tubercles of the lungs, a cyst filled with this peculiar yellow matter. It is altogether a rare disease; unless the small brown tubercle of the liver be it; but of course it is right that I should mention it. I should imagine that it was an innocent affection;—that the deposit was as innocent as that of melanosis.

When you find these new formations (tubercles, schirrus, fungus hæmatodes, melanosis, and kirronosis) co-existing in the body, it

is nothing more than a fact analogous to the circumstances I have stated, respecting *transformations.* I mentioned that the various transformations sometimes co-exist in the same organ; that you will see cartilage in one part of an organ, and bone in another. And so with respect to mere changes of size and consistence. You will find them co-exist in the same organ; so that one part of an organ will be indurated, and another softened; one part hypertrophied (over-nourished), and another atrophied (wasted). You see the diseases of consistence, and of size, and the diseases of transformation, all blended together;—just as you see the diseases of new formations. And not only so; but you often see new formations, and diseases of change of consistence and of size, all blended together in the same person.

The diseases of which I have now spoken, are those which may affect almost any part of the body; namely, inflammation, scrofula, changes of consistence and of size, transformations, and new formations. I have spoken first of diseases which will affect any part. I do no not mean to say, that each of these diseases will affect any one part; but they may be situated either here or there. Besides these, however, there are other diseases which may be called *general;*—not from their being common to any part of the body; so that they may affect one person to-day in one part, and another in a different part to-morrow, (as is the case with inflammation);—but because they are general in another sense;—they appear to affect the whole body together. Whether these general diseases have their origin in some one spot, I do not know; but, so far as I can observe, they exist more or less throughout the whole body. One of these is a disease called *anæmia*, bloodlessness; a very curious disease; and there is another called *scurvy.* I do not myself know whether these diseases spring from the state of any one part of the body, more than of another; for we see a person bloodless throughout, without any local affection that can be discovered. You see him become pale,—blanched throughout, and excessively weak; and we cannot say that any one organ is labouring under disease, rather than another. So in scurvy, the whole mass of blood, as well as of the solids, is affected; so that these are general diseases in another sense; or, perhaps, we ought rather to say, they are *universal* diseases;—those being properly *general*, which are able to exist here or there. Those of which I shall next speak, therefore, are rather universal diseases; and perhaps the distinction I have drawn between *general* and *universal*, will be seen to be proper.

Again, there is another set of diseases which may themselves be local; but which produce effects so universal, that if they have really a local seat, it is at one spot in one patient, and at another spot in another patient. I refer to fever; and, indeed, I may say *fevers;* for there are various kinds of what is called *fever;*—to say nothing of eruptive diseases. Many persons speak of fever (be it intermittent, remittent, or continued) as having a particular locality; but I do not think they have proved the correctness of their assertions; and ac-

cording to our present state of knowledge,—though ready, of course, to change my course, when more knowledge is imparted to us,—I shall prefer considering these also as universal diseases.

Besides those general and these universal diseases, there are other affections, which consist (so far as we know) of a mere affection of function; and in which, at least in many cases, there is no structural disease. It is possible that all diseases may be more or less structural. Some persons say so; but I cannot help believing that some diseases are entirely *functional.* With respect to diabetes, for instance, I have frequently opened persons who have died of it; and the disease appeared to be entirely functional. So in cases of insanity, frequently no disease of the brain has often been discovered. It appears to have been entirely functional. Of course the disease is corporeal,—just the same; but *corporeal* is not *structural.* A disease may be corporeal and yet merely *functional;* for there may be no change of structure.

There are other diseases, entirely *mechanical.* Hernia is, of course, a disease; but it is a mechanical affection altogether. I mentioned that even fractures and luxations are classed, in systems of nosology, as diseases; but at any rate hernia is called a disease; and it is entirely mechanical. There are other diseases which arise from another animal having taken up its abode with us. Such is the case with worms in the alimentary canal; and the existence of various insects upon the surface of the body.*

Thus you may have *general* diseases;—that is to say, diseases attacking any one part; and you may have *universal* diseases;—diseases which, according to our present state of knowledge, appear to be diffused throughout the whole body, without any particular locality. Again, we shall have to speak of diseases which are *func-*

* The late Dr. Fletcher, of Edinburgh, with the view of assisting the memory, used to include in a table all the parasitic animals (twelve in number) to which the human body is liable. We give this table below. The nomenclature adopted is that of Rudolphi; but we have added a few synonymes.

I. Cystica (Hydatids).
  1. Cysticercus Cellulosus (Bladder-tailed Hydatid).
  2. Echinococcus Humanus (Acephalocyst).
II. Næmatoidea (Cylindrical Worms).
  3. Hamularia Subcompressa.
  4. Ascaris Lumbricoides (Lumbricus).
  5. Trichocephalus Dispar (Trichuris Vulgaris; Long Thread-Worm).
  6. Oxyuris Vermicularis (Ascaris Vermicularis; Thread, or Maw-Worm).
  7. Strongylus Gigas (Urinary Worm).
  8. Filaria Medinensis (Dracunculus; Guinea-Worm, or Hair-Worm).
III. Træmatoda (Intermediate Worms).
  9. Dystoma Hepaticum (Fasciola Hepatica; Fluke).
  10. Polystoma Pinguicola (Fat-Worm).
IV. Cestoidea (Tape-Worms).
  11. Bothriocephalus Latus (Tænia Osculis Superficialibus; Broad Worm).
  12. Tænia Solium (Tænia Osculis Marginalibus; Long Worm.)

Succinct remarks by Dr. Fletcher on the localities inhabited by these different animals, together with various other interesting particulars respecting them, will be found in the "London Medical and Surgical Journal," for June 17, 1837.

tional, affecting particular functions;—not organic at all, but entirely functional; and affecting only special parts. For instance, diabetes, as a disease of the kidney, can affect no other part than the kidney; and insanity can affect no other portion than the brain. Spasmodic asthma, also, is often a functional disease. I have opened persons who have died of or with the disease, (and others have done the same), where no trace of disease could be found. You may have *mechanical* affections likewise; and the existence of parasitic animals, —*parasitical* diseases.

But I shall content myself with the general account already given of *inflammation* and *structural diseases;* and shall consider *functional*, *mechanical*, and *parasitical* diseases, not in general, but only in detail,—when speaking of the diseases of each part of the body. Previously to this, however, I must give you an account of *universal* diseases.

ANÆMIA.

The first of these universal diseases to which I shall direct your attention, is called *Anæmia;*—a word which explains itself;—the want of blood. Blood is present; but there is a great deficiency of it. I have no doubt that the fault resides in some one particular spot in the function of forming blood; but in our present state of knowledge, we can only speak of it as a universal disease. When a person labours under this affection, we might state, *à priori*, what the symptoms must be. In the first place there is great debility; in the next place the skin is soft and of a deadly pale wax-colour; in the next place the white of the eye is bluish, the inner part of the mouth is colourless, the lips are exceedingly white, and even the tongue is pale. The pulse is in general about 80; but exceedingly feeble, and very easily excited;—the least stimulus,—the least mental emotion, as well as corporeal movement, produces a great momentary acceleration. Respiration also is hurried on the least exertion. The appetite is bad; and it is said that there is constant thirst. There is œdema of the legs at last; and, finally, sweating;—sweating induced by the great debility. After death, the colour is much the same as it was during life;—the corpse is not paler than the living subject; for when this disease is intense, persons are really corpses in appearance.

So far, I think, one might before-hand pourtray the disease merely upon reflection, without ever having seen or read about it. But in certain cases of this disease, the stools have been observed to be dark-coloured and fœtid; the appetite to be bad; and almost every thing at last to be vomited. When persons have been opened, there has been found universal internal paleness, softness, and want of blood, and more or less excess of fluid in the serous membranes;—a fact corresponding with œdema of the legs, and with sweating in the last stages.

This disease, in a peculiarly marked form, occurred formerly in France, to a great number of workmen in one particular gallery, at a

coal-pit situated at Anzain, near Valenciennes. The disease was preceded by tormina, retching, green stools, thirst, and wasting, for ten or twelve days; and then the affection appeared as I have now described it. It lasted for six, or even for twelve months; and then ended in death. At length the proper treatment was discovered. You will find a description of this endemic disease, given by Professor Halle. It might be called *endemic*, from having been confined to a particular mine; and not only so, but to a particular gallery in a mine; as though it arose from some effluvia. You will find a similar case described by Dr. Combe, in the first volume of the "Edinburgh Medico-Chirurgical Transactions." The patient was a corn merchant's son; and no evident cause for the disease could be discovered. Mercury was given to the French patients, and did them a great deal of harm; for it is a state of the system in which mercury is very injurious. Opening one patient, and finding the internal vessels almost bloodless, they no longer gave mercury, but iron (carbonate, or rather oxide, of iron) in considerable quantity; with opiates and tonics, and good food; and the patients got well. They exhibited signs of improvement in the course of eight or ten days; and from that time the greater part, I believe, recovered. A similar occurrence took place at Dunkirk; and the treatment there was exactly the same;—the exhibition of iron; and the patients recovered equally well. It was found, however, that relapse was very usual; and that the remedy had therefore to be continued for a considerable time. I believe the patients at Dunkirk, were persons who had been sent from the mines to which I before referred; but the same treatment was adopted, and was followed by the same success. In anæmia from *loss* of blood, as well as from *deficient formation* of it, iron is one of the best remedies. I must mention that Dr. Combe used both the sulphate and carbonate of iron; but he does not mention the doses, or the length of time they were given. Mercury, which appeared to be injurious in France, was also exhibited; as well as a number of other drugs; so that the iron did not appear to have a fair chance.

CHLOROSIS.

There is a disease common to young women, either about the time they ought to menstruate, or soon after they have began to do so. It is called *Chlorosis;* and appears to be a state exceedingly similar to that of Anæmia. It occurs occasionally to persons more advanced in life; and a similar affection occurs also to men. Strictly speaking, it is not chlorosis in *men;* because we say that one of the symptoms of chlorosis, is an absense of the menses;—the menses not appearing at the proper time of life, or retiring just after they have presented themselves. Of course, that is not a symptom of the disease in men; and therefore we cannot say to quibblers it is chlorosis, when we see it in men. But let us consider *things*, more than *words;*—let us consider things as pathologists. It is a fact

then, that men will sometimes fall into a state of anæmia and debility, very similar, in all appearance, to that state which in women is called chlorosis.

When a woman has this disease, (which is so common, that you will see instances every day), there is general paleness. There is swelling of the face and ankles; weakness; a great sense of tension of the legs and feet; dyspnœa; palpitation; the pulse either quick or easily rendered so; and there is a deficiency of menstruation. Now these are the symptoms of chlorosis mentioned by authors; and they are, for the most part, exactly the symptoms that occur in the disease called *anæmia*. I have no doubt the pathology, or proximate cause of these two diseases, is exceedingly similar. In women who have chlorosis, the alimentary canal is often very much disturbed; and that was the case with the Frenchmen whom I have mentioned. There is sometimes a great derangement of the stomach; or, if the cause of hunger is cerebral, we must say a derangement of mental feelings. Patients will long for all sorts of things; such as chalk, sealing-wax, or brown paper;—and they are not always the worse for eating them. Their stomach manages them pretty well;—such is the departure from the natural state of things. Very frequently, too, they are costive. They will sometimes eat the most filthy things;—things that one would never think any human being would touch, except cannibals. They will even take pleasure in offensive smells; and long to eat what they do eat in a privy. That, however, is an intense state of the affection.

I believe the best remedy for chlorosis, is the same which was found useful in France; namely, iron. You will find no medicine whatever act so beneficially as iron. I am not sure that the carbonate of iron is better than any other preparation of that medicine; but with that I know you will generally succeed. It is a disease not to be treated by bleeding, or profuse purging. The bowels are only to be maintained in a regular state. You must not allow a collection of trash to be formed in them; but beyond that, purging does harm. All evacuants were found to do harm, in the cases of anæmia in France; and I know from my own experience, (which is necessarily very extensive, in so common an affection), that iron is by far the best remedy for chlorosis. Persons will lose their puffiness under it, —lose their difficulty of breathing; and will gain strength, and soon gain colour.

You will find an affection similar to this, when I come to treat of diseases of the heart. Persons will have violent palpitation, and become pale; and the state is not one indicating bleeding and purging; for in such a complaint as this, I know they will be made worse by those measures. But very much to my surprise, when I first ventured on the practice, and frequently to the surprise of others, iron has remedied this morbid condition of the system, to a great extent. It will not cure organic disease; but when the heart, and body at large, have thus become almost bloodless, and extreme

faintness has been induced by it, (so that you have a quick, irregular, and sharp pulse), you will find that the patient will experience the greatest relief, from the exhibition of iron.

You will observe that there is no confusion in all this. These diseases, although they are not spoken of by authors as analogous affections, are all of the same family. There is a want of the production of blood; though wherein the defect consists, I do not know. In the cases which occurred in France, one would suppose that some deleterious substance affected the functions of the body. In chlorotic women, frequently no cause can be discovered. In organic disease of the heart, patients will continually fall into a condition of the system, similar to that which we observe in chlorosis; but with palpitation ten times greater than ever occurs in that affection. In various visceral diseases, especially of the spleen and stomach, anæmia occurs.

SCURVY.

The word "*scurvy*" is said to be derived from some German words;—either from *scharf-pocke* (meaning *sharp* or *violent pock*) corrupted to *scharbock;* or from *sharf-pocke* (meaning *scab* or *scurf-pock*). However this may be, it is from the word *scharbock*, Latinized and corrupted, that *scorbutus* is derived; and a very barbarous word it is. From this we are said to have our English term "*scurvy;*" but I should rather think it came directly from the Danish word *scurv*. This name, "*scurvy,*" is used by the vulgar in a very indefinite sense; being applied by them to any ill-looking chronic cutaneous disease; but in our profession it is restricted to a particular affection.

This disease is characterized by a bloated surface; and by petechiæ, vibices, and ecchymoses. By "*petechiæ,*" are meant minute dark red or livid points, little larger than the point of a pin; spots still larger than these are called "*vibices;*" and when instead of spots we have patches, the word "*ecchymosis*" is employed. They all relate to the same appearance, but denote a difference in extent. With respect to colour, these points, specks, or patches, are of a dark red or purple hue; but may contain all the shades which we see in bruises. In this disease, then, the surface is bloated; and upon it are seen points, specks, and patches, generally of a red or purple colour, but sometimes of all the shades which we see in common bruises. A very remarkable circumstance also attends the disease; and that is, the hardness of many parts, but particularly of the thighs. If you examine the thigh of an individual labouring under scurvy, (though only in a very slight degree), I believe you will find it hard generally, but more especially under the hams. In severe cases, I have seen it as hard as a board. I have not seen many cases of the disease; but in all of them I have noticed this circumstance. The gums are particularly affected. They are spongy, and bleed; and either they or the breath, or both, send forth a very offensive smell. Such is the disease of the gums, that the teeth very frequently

fall out; and in addition to their being spongy and bleeding, they become enlarged and livid.

This is a disease of great debility; and the spirits are always very much depressed. So great is the weakness, that people very frequently faint from time to time; and the pulse is found to be feeble, and the surface of the body cold. Very often, ulcers form upon the surface, and discharge a thin and fœtid bloody fluid; and at last a coagulum of blood is formed. The gums are in precisely the same predicament. The blood which is discharged and coagulates upon the ulcer, is with great difficulty separated from it; for it adheres to the ulcer and the flesh which is beneath; and, when you remove such a coagulum, the flesh is found to be, like the gums, soft and spongy. If you remove the coagulum, it is instantly renewed. A fresh oozing of blood takes place; a second coagulum supplies the place of the first; and at length a fungus will sprout forth,—a soft, flaccid, dark looking fungus. It sprouts as fast as you take it away; and is called by sailors *bullock's liver*. It may attain an enormous size. If this fungus be repressed, a gangrenous tendency is frequently observed. The leg will swell, and become more spotted and painful. You know, of course, that when a fungus sprouts forth from the dura mater, after a fracture of the skull, it is very dangerous to repress it. If the part be compressed, dangerous symptoms very likely ensue. In like manner, it is found injurious, in scurvy, to repress this "*bullock's liver;*" because the pressure induces a gangrenous tendency. The very slightest bruise, inflicted upon a patient labouring, to any considerable extent, under scurvy, will generally produce an ulcer of the description I have mentioned.

There are some other remarkable circumstances, respecting this disease. Old wounds, and even fractures, have a tendency to recur under it. Wherever an ulcer has existed,—wherever a solution of continuity in soft parts has taken place previously, although the parts may have been well cicatrized, yet under this disease the wound often opens again. Nor is this occurrence confined to soft parts; but even bones themselves (as I just now stated) which were formerly fractured and repaired, become again disunited;—showing that the callus of bones is not so strong, as the original parts of the body; and that it suffers, when the rest of the bones do not. Another very singular circumstance connected with this disease, is the occurrence of nyctalopia, or night-blindness. Patients labouring under scurvy, frequently become blind (either altogether or in part) when night comes on.

The great cause of this disease, appears to be the want of fresh animal and fresh vegetable food. It is on this account that the disease was formerly very common at sea; for, at one period, sailors were supplied with nothing but salt provision. So badly were ships formerly provided for, and so faulty was the general management, that in the year 1726, when Admiral Hosier sailed to the West Indies with seven ships, he buried his ship's company twice; and then died himself of a broken heart. Deaths to the amount of eight

or ten a-day took place, formerly, in a moderate ship's company. The bodies, after being sewn up in hammocks, were washed about the deck, for want of sufficient strength, on the part of survivors, to throw them overboard. Lord Anson, in the year 1741, lost one half of his crew, by scurvy, in six months. Out of nine hundred and sixty-one men who sailed with him, only three hundred and thirty-five were alive at the end of the year; and at the end of the second year, only seventy-one were fit for the least duty;—not to say *duty*, but for the *least* duty. Sir Gilbert Blaine says that the disease used to appear in about six or seven weeks from the beginning of sea-victualling.

You cannot have a better description of the dreadful mismanagement formerly prevalent, in regard to the navy, than you will find in "Roderick Random," Smollett, both in that work and in his "History of England," gives an account of the armament which, about the same time that Lord Anson's expedition took place, was sent out against Carthagena. The description is from his own observation. He says the provision consisted of putrid salt beef, salt pork, and musty bread. To the salt beef the sailors gave the name of *Irish horse;*—I suppose that it looked like horse flesh, and that the contractors lived in Ireland. The salt pork came from New England; and was neither fish nor flesh, but savoured of both. The bread came from the same country; and the biscuit, like a piece of clock-work, moved by its own internal impulse;—owing to myriads of insects that dwelt within it. The butter was served out by the gill; and was exactly like train-oil thickened with salt; and though there was was water enough to allow each man half-a-gallon daily, for six months, yet each had only a purser's quart a-day; and this in the torrid zone, where a gallon would have been hardly enough to repair the waste of perspiration. You cannot wonder, therefore, that scurvy formerly prevailed to the dreadful amount we have stated.

The disease prevailed likewise on shore, however. Indeed scurvy, at one period, was one of the most fatal diseases in London; so that, even so late as the seventeenth century, there were from fifty to ninety deaths from it annually; and in the year of the plague, there were not fewer than one hundred and five deaths. These frightful occurrences took place regularly; and not during a particular year. The same reason existed for the prevalence of scurvy in London, which produced it at sea; for the food of the Londoners was then salt beef and pork, with a little veal. The lower orders, in the time of Henry VIII, had very little else. The fact was, that only pasture land was then common; for very little was cultivated. Animals, therefore, could feed only during the summer and autumn. Hay being a later improvement, it was impossible to feed them longer than that period; and, therefore, as the winter came on, they were killed and salted; and thus a store of provision was laid up until the next spring. Garden-stuff, too, was extremely scarce in those days; so that Catherine of Arragon, one of the numerous wives of Henry VIII, was actually obliged, in the beginning of the sixteenth

century, to send to the Netherlands for a gardener to raise her a salad;—so ignorant were the gardeners of this country, of what is now considered within the reach of every body. Cabbages, and other garden-stuff, were not cultivated in England before the reign of Henry VIII. Government, too, at that period, seemed to encourage the consumption of this meat; for the price of meat was fixed by law at one-*twentieth* of what it now is; whereas wheat was fixed at only one-*tenth* of its present price. Care was thus taken to have a good supply of *animal* food; but *vegetable* food was comparatively neglected. I may mention that, in 1700, a cabbage cost threepence; while, in 1760, it cost only one halfpenny. Such was the advance of art, and the increase of knowledge, that this great difference occurred in the price of a cabbage, at those two periods. Other greens too, at first, were proportionately dear; and vegetables were only used at that time on Sundays, and (as a great dainty) when people had company.

The use of salt or putrid meat, appeared to be the cause of scurvy. But it was not the salt; for salt, though taken in the greatest excess, will not occasion scurvy; and scurvy will take place where no salt is used. Nay, persons will have scurvy, who eat no meat at all; and therefore it is not this, but the want of other food,—the want of fresh animal and vegetable food,—that induces the disease. I have seen several,—not a large number,—but several cases of scurvy, in individuals who had eaten no meat at all. They had been deprived of meat of every description; and it arose in them from the want of food. You will find, in the second volume of the "Transactions of the College of Physicians," two cases mentioned by Sir Francis Milman, of women that had the scurvy in the country. They had eaten no meat whatever; but had lived on tea and bread, after having been accustomed to better food. Sea and land-scurvy, I believe, are exactly the same; and Dr. Musgrave (who published a work on the Gout, in 1703) mentions that this disease was common in Somersetshire; so that you observe it prevailed at sea, in large towns, and in the country.

There can be no doubt that many circumstances conspire to the occurrence of this disease. Cold and the want of exercise unquestionably encourage it; for sailors are observed to suffer in cold latitudes, when they are placed under precisely the same circumstances, with the exception of latitude, in which they escape it in warm climates. This fact strikingly illustrates the effect of cold. Then, as to the want of exercise, Captain Cook says that the people of Kamschatska, who are habituated to hard labour, never have the scurvy; while the Russians and Cossacks in garrison, who live in the greatest indolence, are subject to it. Sir Gilbert Blane says, that only the prime seamen, who were exempted from pumping, were attacked with scurvy. He instances the case of a particular ship's crew; and says, that the prime seamen suffered from the disease; whereas those who were obliged to work hard at the pump, from time to time,—the ship having proved leaky,—escaped. Moisture

is also said to have a considerable effect; especially, I presume, when united with cold. La Perouse attributes the prevention of scurvy, in his crew, very much to the vessel being kept dry by fumigation, and by braziers of hot coals. Captain Parry ascribes the first case of scurvy, in one of his expeditions, to moisture. It was observed, when scurvy prevailed at the Penitentiary at Milbank, a few years ago, that the persons employed in the kitchen always escaped; perhaps, however, they got better food than the rest, or more of it; but at any rate they had a warmer place. Captain King told Dr. Macmichael, (as he stated in a paper read last year at the College of Physicians), that, in a voyage round the south coast of America, no cause of scurvy was apparent,—the crew having had plenty of lemon-juice,—except that there was a remarkably cold and moist state of the atmosphere. I do not believe that moisture alone will occasion it; but moisture certainly aggravates the effects of cold in this disease; as it does in all others.

The difference between ships' crews now and formerly, is very striking. While the crew of Lord Anson suffered so much in a voyage round the world, that of Captain Cook, in a voyage subsequently performed, suffered nothing. The difference arose from this circumstance: Captain Cook had a good supply of portable soup, sour crout, and fresh meat; and he kept his men in regular exercise; and took care, at the same time, that extreme cleanliness and ventilation should be observed. In addition to this, they were away from land only about three weeks, on their longest cruise; although absent from home so long. Such measures as he adopted will generally prevent scurvy, even if there be no fresh provision on board, provided there is a supply of lemon-juice; and sometimes, in spite of the neglect of all these particulars, lemon-juice alone will prevent it.

The great remedy for scurvy, is fresh food,—animal and vegetable. Farinaceous vegetable substances alone are insufficient; but when fresh meat cannot be procured, I believe lemon-juice will be found the most efficacious medicine. The effects of lemon-juice on the disease are speedy and wonderful;—so wonderful, that the compiler of "Lord Anson's Voyage," after describing the disease, and the horrors which took place from its ravages, says that the cure of such a complaint seems impossible, by any remedy, or any management, that can be employed. Scurvy was formerly set down, without hesitation, as an incurable disease;—not only as a disease incurable *then*, but as being so formidable in its nature, that it *never* would be cured; and yet, in almost every case, we can now cure it with the utmost facility. It is not only lemon-juice that will cure it, but all the hesperidæi; such as the lime, and Seville and unripe China oranges. Malt and sour crout are thought to have a similar property. Lemon-juice is preserved by mixing one-tenth of spirit with it. The custom, I believe, is to give three table spoonfuls every morning to each man, for the purpose of keeping the disease away. One ounce of lemon-juice, with one ounce and a half of sugar, is the present navy allowance; and it is said that scurvy rarely occurs now in the

longest voyage. Citric acid is thought to be inferior to lemon juice. During the nine years previous to this supply, the average number of sick sent to the hospitals, was one man in three and nine-tenths of the whole navy; and in the succeeding nine years, it was only one in eight and four-tenths. The juice is also said to improve the general health. I may mention, as a good illustration of the power of lemon-juice, that the ship "Suffolk" left England in April 1794, and had no communication with land for twenty weeks and a day; and yet, during all this time, she had only fifteen sick, and those slightly. They were soon cured by an augmentation of the first allowance of two-thirds of an ounce; and at her arrival, not one had the scurvy. In 1800, the channel-fleet (consisting of twenty-four ships of the line, besides smaller vessels) had no fresh provisions for sixteen weeks; but they had plenty of lemon-juice, and not a single instance of scurvy occurred; whereas in 1780, the channel-fleet could not keep at sea beyond ten weeks, and was worn out with scurvy and fever. Two thousand five hundred men were sent into port with the scurvy. We read in Purchas's "Pilgrim," that Commodore Lancashire sailed from England, with four ships, for the Cape of Good Hope, on the second of April; and arrived at Saldanha Bay on the first of August. The Commodore's own ship was in perfect health, owing to the administration of three table-spoonfuls of lemon-juice, every morning, to each of his men; whereas the other ships were so sickly, as to be unmanageable for want of hands; and the Commodore was obliged to send men on board, to take in their sails, and hoist out their boats.

This disease, of course, occurred in ancient times. It was known in the Roman army in Germany, and also in the "Holy Wars," as they were impiously denominated; but it was first particularly noticed in the crew of Vasco di Gama, in 1497. You will find it mentioned by Pliny, as occurring in the Roman army, under the command of Germanicus. But with respect to the remedy, its discovery appears to have been left for modern times; but still not for *recent* times; for you will find it mentioned as far back as 200 years ago. There is a curious fact connected with it, and one which is very instructive, as teaching us not to despise any thing without good reason. It is said that when the London College of Physicians was applied to by Government, for a cure for scurvy, they advised vinegar, which has very little power in the affection; and that a Fellow of the College, who wrote on the disease in 1753, never adverts to lemon-juice at all in his Treatise; and yet that, two hundred years ago, it was mentioned in the "Surgeon's Mate, or Military and Domestic Medicine;"—a work published in 1636, by "John Woodall, Master in Surgery." He ends his praise of it by saying, that he dare not write how good a sauce it was, with meat; lest the chief in the cabin should waste it, to save vinegar. It is said to have been mentioned even still earlier,—in Purchas's "Pilgrim," published in 1600. Dr. Lind, of Haslar Hospital, revived the knowledge of it, more than one hundred years afterwards. He

stated its peculiar powers, in the third edition of his work on the "Diseases of Seamen," in 1772; but even then it was not brought generally into use; and the navy actually suffered most frightfully from scurvy till 1795. Although the remedy was mentioned two hundred years ago, and again in a well-known surgical work in 1636, yet the navy suffered from the want of it till 1795. Earl Spencer, the father of the present Chancellor of the Exchequer,* was then at the head of the Admiralty; and on the representations of Dr. Blair and Sir Gilbert Blane, (who were commissioners of the board of sick and wounded seamen), a good supply of it was ordered by Government. In less than eighteen months afterwards, there was not a case of scurvy in Haslar Hospital. In 1780, there had not been fewer than 1457; in 1806, and in 1807, there was but one.

So great is the effect of this remedy, that you will find the following passage in Sir W. Herschel's work, published in Dr. Lardner's "Cyclopædia," on the cultivation of the physical sciences.† "At present, the scurvy is almost completely eradicated in the navy;—partly, no doubt, from an increased and increasing attention to general cleanliness, comfort, and diet; but mainly from the constant use of a simple and palatable beverage,—the acid of lemon, served out in daily rations. If the gratitude of mankind be allowed on all hands, to be the just meed of the philosophic physician, to whose discernment in seizing, and perseverance in forcing it on public notice, we owe the great safeguard of infantile life;‡ it ought not to be denied to those, whose skill and discrimination have thus strengthened the sinews of our most powerful arm; and obliterated one of the darkest features, in one of the most glorious of all professions."

The scurvy is now prevented, by great attention to cleanliness; by giving sailors food as wholesome as possible; by attention to exercise and cheerfulness; and by a regular supply of lemon-juice. In spite of all this, however, sporadic cases still occur; but, in general, that is all. I have myself had several cases of this disease in London; and some of them were in persons who had never been at sea; and who had eaten no salt meat; but who had been deprived of food nearly altogether. Others were sailors, who came on shore labouring under the disease; for in merchant ships, there is frequently the greatest neglect. I had one patient, a few months ago, who had been sixteen weeks at sea, and had nothing but biscuit and the hardest salt beef, during the whole voyage. There was no medical man on board; but that, I suppose, is unavoidable in small ships. He was, as might be expected, labouring under scurvy to a great extent; and he said that several of the crew had died. I am not sure that the lemon-juice, which I gave these patients as a matter of course, did them any good for they were allowed fresh

* The Chancellor of the Exchequer, at the time these observations were delivered, was Lord Althorp; who has since succeeded to the earldom.

† "Preliminary Discourse on the Study of Natural Philosophy."

‡ Alluding to Dr. Jenner, and the Cow-Pock.

meat and greens every day, with porter, and other articles of good diet; and this was quite sufficient, I am sure, to cure the disease. I gave them lemon-juice in addition; because we have such great authority for its employment. However, some persons now begin to say that the lemon-juice does no good;—that the benefit entirely arises from the other means that are employed; and that the neutral salts, particularly nitre, answer a better purpose. I dare not say, however, that authority respecting the powers of lemon-juice, so accumulated and so immense as it is, is at all to be disputed. I certainly cannot but think that, till we have further facts, it is our duty in every case to supply lemon-juice, (or similar things, if that cannot be obtained), in the hope of doing away with the ill effects, which a want of fresh food occasions. I may also mention that, with regard to local applications, lemon-juice is found to be one of the best. When there is a scorbutic ulcer, I believe a slice of lemon laid upon it, is one of the best applications that can be employed. Père Lebat is said to have mentioned this in his "Voyage to the Antilles."

This is a disease which I should say is of a chemical nature,—if any one be so. In one sense, the constitution is not at all in fault. All the fluids and all the solids appear to be changed; but you have only to give a different chemical state to the body, and the disease is cured. You need give nothing which acts by a specific operation;—no drug, I mean, which acts as a medicine; but employ fresh articles of diet, and you remedy the depraved constitution of the whole mass of solids and fluids. I have, therefore, mentioned this disease, before I came to any of those which are clearly seated in particular parts. I am not aware that it attacks any one part in particular. It seems to be a cachectic state of the whole frame; and if any affection be an instance of universal disease, I should certainly say that it was scurvy.

There is an affection very similar to the scurvy in some respects, which has been arranged and described, by Willan, among cutaneous diseases; and which is called *purpura*. Some are of opinion that this is the same as scurvy; but I cannot think so, for reasons which I will state when speaking of diseases of the skin.

INTERMITTENT FEVER.

Fevers are divided in general into three kinds;—intermittent, remittent, and continued. Some divide them (as you may recollect I mentioned in my introductory observations) into intermittent and continued only; and subdivide the latter into those which continue unremittingly, and which are therefore called *continent;* and into those which have remissions, and are called *remittent*. You may divide them in either of these ways. I shall first speak of *intermittent* fever.

All fevers, whether intermittent or continued, are characterized by those symptoms which I before spoke of, when treating of inflammation, under the name of *pyrexia;*—that particular set of symp-

toms denominated *pyrexia*. In speaking of inflammation, I mentioned that there are only two stages well marked in the pyrexia of that complaint,—cold and heat; but in an attack of real fever there are often three;—a *cold*, a *hot*, and a *sweating* stage. In intermittent fever, these are very distinctly marked. In *continued* fever you may have a shivering at the beginning: but then it will terminate in the course of the disease, and you will have to treat long continued heat. It is only towards the last, that there are any sweats; and frequently, there are none of a remarkable character; for there is often merely moisture of the skin, as the disease declines. But in *intermittent* fever there are usually three distinct stages;—a cold, a hot, and a sweating stage; the first of which is the cold stage.

When this stage is about to commence, the patient feels himself very weak and listless. He begins to yawn, gape, and stretch. He finds his mind less active; and his external senses are more or less dull. Sometimes there is even real stupor, but in all cases the patient's mind is very dull. He is unable to go on with what he is about; and even his external senses are impaired. There is also, at the same time, a great depression of spirits. Very soon a sensation of coldness is felt,—first of all in the back; and the patient will complain of chilliness, before others who touch him can perceive it. As soon as the cold stage has begun, the surface becomes pale and dry; and the mouth and fauces also become dry. Then the patient begins to tremble slightly. He becomes really cold;—the temperature falls perceptibly to others. He trembles more and more, and becomes colder, till he is in a state of downright shivering, and then his jaws chatter. The constriction of the skin at this time is so great, that it becomes rough; and, in common language, is called "*goose's skin;*" but in Latin, *cutis anserina*. Such is the shrinking, that rings will fall off that previously fitted very well. There is a sense of *creeping* and *shuddering* over the skin; the hairs of which stand on end; and this state is called *horripilatio*. The urine which is made at this time is pale and scanty. Probably the same constriction of the secreting vessels of the kidney takes place, which occasions the dryness of the surface of the body. It is the same constriction, I presume, of the secreting vessels, that gives rise to the dryness of the mouth and fauces, and also to the thirst. This is altogether a state of debility; and consequently the pulse is weak, and sometimes slow; and the breath is generally short, from the accumulation of blood, I presume, in the internal parts. Sometimes the stomach is affected with vomiting. In a very intense cold stage, the face, hands, and feet, become blue; the fingers shrivelled, and the eyes sunk.

Here you see that the blood has receded from the surface, and probably from all the small vessels; so that it has accumulated, in great quantity, in the large vessels of the interior. After this state has existed a certain period, of very various duration, the skin relaxes. It regains its warmth, colour, and sensibility; and the pulse becomes quick and fuller. The heat, the colour, and the sensibility

of the skin, go on increasing; till at length they exceed their natural standard, and the pulse grows full and very rapid. Such is the excitement now, that not unfrequently the patient complains of headache; and even delirium occurs. The thirst, the dryness of the skin, and the deficiency of the urine continue;—probably because the extremities of the secreting vessels are still in a state of constriction; though the small vessels have become filled with blood. The urine, however, changes its character. From being pale and watery, it becomes high-coloured; but it is still clear. The breath becomes fuller;—most probably from the blood getting into the small vessels; and the patient can take a deep inspiration. There is not that slow breathing, which there was at first; but still there is more or less oppression; for the heart is in violent action; and when that is the case, there is always a degree of dyspnœa. That state now takes place which is vulgarly called *fever*. If the disease intermit altogether, it is called *ague;* from the French word "*aigue*,"—sharp,—acute. But the common people limit the word "*fever*" to the hot, or hot and sweating stages; and denominate only the cold stage "*ague;*" so that it is common to hear one of the lower orders tell you, that he has got the ague and fever; but *ague*, properly speaking, includes the whole of the three stages. You may recollect the following passage in Macbeth:—

—— "The obscure bird
Clamour'd the livelong night: some say the earth
Was *feverous* and did *shake*."

From this it appears that the word "*fever*" was applied, in those days, to the *cold* stage, as well as to the *hot*. There can be no doubt, that both the expressions "*pyrexia*" and "*fever*," though made by medical writers to include the whole stages, imply properly the hot only; as the former is derived from πῦρ,—fire; and the latter from *ferveo*,—to be hot.

After the hot stage, the skin at length becomes still softer. It also grows moist; and the moisture augments, till at last the person is in a profuse sweat. The same relaxation of the internal secreting vessels takes place in consequence of which the thirst declines; the urine becomes copious; and the vessels let through so much substance, that it forms a lateritious sediment. After the sweating has continued an indefinite time, the pulse gradually grows slower; and the sweating and all the other symptoms diminish. The appetite, which is generally absent in all the three stages, now returns; and the patient is as well as though nothing had happened. If the disease last very long, the patient becomes shattered by it; but in general, if the disease be not very severe, if there be no local affection, and if the patient have not laboured under it long, when the paroxysm is over, he is much about the same as he was before.

There is great variety in the intensity of every one of the symptoms which I have mentioned. There is great variety in the relative intensity of the different stages; and great variety in the intensity of

the whole disease together. This, however, is not all. There are occasionally *incidental* symptoms; such as tetanus, convulsions, fainting, violent delirium, and the appearance of petechiæ on the skin. Some persons, while in the paroxysm, have been known to have their muscles rigid;—absolutely in a tetanic state. Others have been violently convulsed; fainting has occurred; and delirium, in the hot stage, is very common. Sir John Pringle mentions violent delirium, as the character of an epidemic intermittent which he saw prevail. He also mentions that, at Copenhagen, in 1652, petechiæ appeared in the hot stage of an intermittent which prevailed there. Bartholini gives an account of an epidemic, in which petechiæ appeared in the hot stage;—always disappearing afterwards. I have not seen the whole of these symptoms. Delirium, in the hot stage, is common enough; and in two cases I saw, in the cold stage, violent clenching of the hands; so that the fingers and thumbs were drawn together in the most violent manner; and continued so until the cold stage was over.

These stages may all take place in the course of one day, and never return; and then the disease has been called *ephemera;*—a disease of a day's duration. But, for the most part, these stages return periodically. They return, in general, not only regularly, but *periodically;* so that you do not have ephemeral ague, but intermittent fever. The intermission between two paroxysms, is usually part of one day, at least; or it may be a whole day, or two days. By "*day*," in medicine, we mean day and night;—the twenty-four hours. Beyond two days, the intermission is rarely regular. If the intermission be only part of a day, the fever is called *quotidian;*—that is to say, if the attack returns every day (there being an intermission of only *part* of a day) it is called *quotidian*. If there be an intermission of a *whole* day, so that the patient has an attack every *other* day, it is called *tertian*. It assumes this name, because the first day is counted as well as the third. The day on which a person is attacked, is the first; the day of intermission, the second; and the day of the second attack, the third. It is, therefore, called *tertian*. If the intermission extend two days, so that the patient shall have a fit on Monday, none on Tuesday, none on Wednesday, but one again on Thursday, then it is called *quartan*. The day of the paroxysm constitutes the first; then follow the two days of intermission,—making three days; and then, on the fourth, you have another paroxysm. These are the most common forms of the types of intermittent fever; and, in London, the quotidian and tertian are far more frequently seen than the quartan.

But the intermission may be still longer; so that you may have, not a quartan, but a quintan, a sextan, a septiman, or even a deciman. In the last there is an interval of nine days; and the first day, being counted, makes up the ten. I heard a gentleman observe, that he saw a septiman take place for three weeks; that is to say, the person had a paroxysm after an interval of six days, occurring on the seventh day, regularly for three weeks. In 1827, I myself had a

patient in St. Thomas's Hospital, with a septiman. He regularly had his disease, after an interval of six days. During the same year I had another patient, who had an interval always of four days; so that his disease was a quintan. I once treated a double octavan. A man had a paroxysm every Sunday and Thursday;—the Sunday paroxysm being at one hour; and the Thursday paroxysm always at another. When they extend to these periods,—when they are more than a quartan,—when the intermission is longer than two days, the disease is called *erratica;*—it wanders out of the usual regular course. The epithet "erratica" is also given to an ague, which observes no regular period; which at one time is quartan; at the next quintan; &c. You will find the term "*erratic*" employed by authors in both these senses.

These are, for the most part, all the varieties which it is necessary to recollect; but, as a matter of curiosity, I may mention that the disease has sometimes other types. Sometimes you have more than one paroxysm in a day;—more than a quotidian; and I heard a gentleman say, that he saw a case in which there were four paroxysms daily. I never did. But it is very common indeed, to see what is called a *double tertian;* in which you have a paroxysm every day; but in which you see paroxysms two days in succession, which do not belong to each other. For example,—suppose a patient has an attack every day in the week; but the paroxysm on Monday is at eight o'clock in the morning, and the paroxysm on Tuesday at four in the afternoon; while the paroxysm on Wednesday is at eight o'clock in the morning,—like the paroxysm on Monday; so that the paroxysms of Monday and Wednesday agree; whereas the paroxysm on Thursday is at four o'clock in the afternoon;—the same hour as the Tuesday paroxysm. Now this appears a *quotidian*, because it occurs every day; but it is, in reality, a *double tertian;* for it is as if the patient had a tertian which came on every Monday and Wednesday; and another which came on every Tuesday and Thursday; and inasmuch as the paroxysms which occur every other day agree, it is called not a *quotidian*, but a *double tertian;* and in Latin, *tertiana duplex.* But it will sometimes happen that there are two fits on the day of attack, and none on the following day. Supposing the disease comes on every other day, (as, for instance, Monday and Wednesday), but that you have, on each of those days, two attacks; it is then called a *duplicate tertian;—tertiana duplicata.* That is the difference between *tertiana duplex*, and *tertiana duplicata.* I do not know whether you will be questioned on this matter; but it certainly is a singular fact in the history of the disease, that such occurrences take place.

Respecting the double tertian,—the one which comes on every Monday and Wednesday, for instance, and every Tuesday and Thursday, but at different hours,—you will sometimes find scarcely any intermission between the Monday's and the Tuesday's paroxysm; while the intermission between the Tuesday and Wednesday paroxysm is distinct enough; or, *vice versâ*, that the one is

hardly over when the other begins; and it is then called *semi-tertian*, *half-tertian*, or (if you prefer Greek) ἡμιτριταια. The paroxysms are brought so near, that it is almost remittent fever; and it is scarcely worth while to call it any thing else than remittent. It has, however, as I have just stated, received the name of "semi-tertian;" and though the interval between the attacks on the first and second day is so short, yet the intermission between the second and third is much greater. You may, however, not only have a *double* tertian;—one on Monday and one on Wednesday at a certain hour; and again on Tuesday and Thursday at another hour; but you may have on Monday two fits, and on Wednesday two fits; and then this is called a *triple* tertian.

You may also have a *quartana duplex* (*double* quartan);—there being an additional paroxysm on the first day of the intermission, at its own hour; and a *quartana duplicata* (*duplicate* quartan);—two paroxysms on the day of attack; and also a *tripled* quartan;—three paroxysms on the day of attack. These things are so minute, however, that you may not be able to follow them in a lecture; and immediately after you have learned them, you will perhaps forget them again; and it is better, therefore, to refer to them in books. The observations I have made, are sufficient for all practical purposes; and I only wish you to be aware, that these extraordinary deviations do sometimes take place.

A paroxysm of intermittent fever, including the three stages, is generally finished in eighteen hours. It is a rare occurrence for it to last longer than that period. Dr. Good, however, quotes an author, who stated that he saw a paroxysm which lasted exactly *one minute*. How the stages were divided I do not know. What was the severity of the cold stage, it is impossible to conceive; but I should think, that when each of these stages was over, the man might have doubted whether he had been ill or not. But authors may be quoted for any thing.

The paroxysm of ague is said, like almost all fevers indeed, more frequently to begin in the day than in the night. As a general rule it may be stated, that the paroxysms commence between eight o'clock in the morning, and the same hour in the evening. Of course there are ten thousand exceptions; but, in the majority of cases, the paroxysm begins in the day. You will find it mentioned in authors, that a quotidian usually has its paroxysms in the morning, a tertian at noon, and a quartan in the afternoon. I believe there is some truth in the observation, that a quartan generally begins late in the day; but you will very frequently see tertians come on in the afternoon, quartans come on at noon, and quotidians in the evening. It is said likewise, that a quotidian has the shortest *cold stage*, but the longest *paroxysm* altogether; that a tertian has a longer cold stage, but altogether a shorter paroxysm; whereas a quartan has a still longer *cold stage*, but nevertheless a shorter *paroxysm* than either of the others. But for these particulars there is no universal rule.

You will find, in authors, some very curious cases of paroxysms

affecting only a part of the body. There are a number of cases on record, by authors entitled to credit. There is one case mentioned, in which a vertical half of the body suffered an attack of ague; and during the cold fit, the other half became convulsed. What is still more singular, the same half was not always similarly affected, but the symptoms changed sides. You will likewise find a case mentioned, where the paroxysms of ague affected one half of the body horizontally. In some cases it has only affected half the head; and Dr. Macculloch says that a paroxysm may affect one limb only. Now these facts are not at all insulated. They are perfectly analogous to many others which are occasionally observed in the human body. Epilepsy will sometimes affect only one half of the body; nay, sometimes it will affect only one limb. Catalepsy will do the same; and paralysis does this so continually, that one of the established forms of palsy, is hemiplegia; and another is paraplegia. Dr. Abercrombie, in his work on the Pathology of the Brain,* says that a friend of his, when in exercise, only sweats in a vertical half of the body;—that there is a line upon the forehead, perfectly distinguishing the sweating from the dry side; but that if he take very violent exercise indeed, then the dry side is at last forced to perspire a little, like the other. You will find in the work of Andral,† (another modern writer), instances in which sweating took place in one half of the body only. In some of these cases it was a vertical, and in others a horizontal half. You will find a case mentioned by Dr. Falconer, in which a child became pale and emaciated in one half of the body only.

Intermittent fevers, during their progress, frequently change their type. From tertian they will frequently become quotidian; from quotidian they will become tertian; and from either of these, they will become quartan; while from quartan again, they will become either of the former. Sometimes they will change their type once; sometimes they will change it more than once; and sometimes they will continue changing, so that they observe no rule at all; and then, as I have already said, they are called *erratic*. Another variety is, that they will not change their types;—they will still remain quotidian, tertian, or quartan; but they will change the hour of their attack. Instead of beginning at the same hour, they will begin later and later, or the reverse; and sometimes they will begin with such irregularity, that a patient never knows when to expect them. Sometimes they will be very irregular at first, and then at last they will grow regular;—seeming only to make up their mind, after a time, how they shall go on. At other times, they will grow milder only. It is a general rule that the paroxysm grows later and later as they grow milder. As the paroxysms become more severe, more intense,

* "Pathological and Practical Researches on Diseases of the Brain and the Spinal Cord; by John Abercrombie, M.D."

† "Clinique Medicale, ou Choix d'Observations recuellies a l'Hopital de la Charité; par G. Andral." This work, which is a vast repository of valuable pathological facts, has recently been translated by Dr. Spillan.

and the disease gets worse, they generally come on earlier and earlier; but when the paroxysm grows later and later, and at the same time milder and milder, it at last degenerates into nothing more than a little chilliness, a little heat, a little sweating, or a little of all combined. It is very common, at last, for the paroxysm to show itself only a little at a certain time of the day; or for there to be only a little sweating, or only a little chilliness. These diseases occur chiefly in spring and autumn. You will therefore continually read in authors of *vernal* and *autumnal* ague. The quartans usually take place in autumn;—that is to say, there are more quartans among autumnal, than among vernal agues.

Although agues have generally these three stages, you will sometimes see the paroxysms imperfect, even before the disease has much declined. I have often seen and cured an ague, in which the cold stage took place, but was never succeeded either by the hot or sweating stage. So sometimes the hot stage will come on alone, being preceded by the cold stage. A paroxysm is generally terminated by the sweating stage; but sometimes there will be no sweating at all. You may have either of the three stages alone. This is worthy of remark; and it is an undoubted fact; for I have witnessed it, over and over again. Cullen says that the cold stage is necessary to the others. He considers that the cold stage excites the *vis medicatrix naturæ;*—that, to get rid of the cold stage, nature bestirs herself, and brings on the hot, and then the sweating stage. But this is a fallacy; for I know you may have the hot stage, without any cold preceding it; and that you may have the cold stage, without any subsequent hot stage. Sometimes there is no regular paroxysm at all; but patients with ague will have, at various periods, a general chilliness, with great depression of spirits; so that they will cry, yawn, stretch, and often be even a little silly, and have a number of odd feelings. Now this state of things is well known by the lower orders; and is called by them, very significantly, the *dumb* or *dead ague;*—an ague which is not at all lively, or does not speak or shew itself it an open and manly manner. It is, however, to be treated exactly like all other forms of the complaint.

I have mentioned, respecting the variety in the paroxysms, that sometimes there will be one stage alone without the others; but one author tells us that he saw all the stages reversed;—that the disease began with sweating; then the hot stage came on; and the paroxysm was closed by the cold stage. Before this disease is fully formed, the attack is sometimes preceded by headache, by pains in the nerves (neuralgia), by vomiting, by general indisposition; and all this may last for a longer or shorter time. These symptoms may cease on the appearance of the disease; or they may continue, more or less, when the affection is established. Even continued fever has preceded ague.

The duration of ague is various. It may be ephemeral, consisting of one paroxysm; or it may last for many years;—at least, it did so before we could cure it so effectually as we can now. One case is

said to have lasted eight-and-forty years. Lommius, on the Continent, who wrote in beautiful Latin, mentions a case which lasted twenty years. One unfortunate fellow (Valescus of Tarenta) is said to have had it all his life. Dr. Gregory said that he saw one case which had lasted four years. On the other hand, Dr. Mason Good quotes Senac for a case, in which disease destroyed life the moment it began. When it proves fatal, Sydenham says it is in the cold stage; because, when the hot stage comes on, nature is getting the better of the disease; and that a patient cannot die from it if nature be recovering, as is the case in the hot stage. But the truth is, that it *will* kill in the hot stage. In hotter climates than our own, there is great congestion of the internal parts of the head; and persons will fall into a state of coma, as they sometimes do here in the first stage. I have known some people have it every spring for many years. Although we have never seen people that have it regularly all the year round, yet most of us have seen individuals who have the disease regularly once a-year. Respecting its duration, however, quartans are said to last the longest. Tertians and quotidians are more like an acute disease; but the quartan, coming on after an intermission of two days, partakes more of the nature of a chronic affection; and being chronic in its *character*, so really it is chronic in its *duration*. Certainly it is the quartan that, in general, lasts longer than the others; and it is generally more difficult to cure. On the same principle, again, it is said that a tertian, left to itself, lasts longer than a quotidian.

Ague affects all ages. It is seen in young children even at the breast; and I have under my care for this affection, an old man, about eighty years of age. However, it is said to affect children earlier than when at the breast;—to affect them before they are born. You will find cases mentioned, not only in which the children had a paroxysm of ague, the very moment that they came into the world, (just as it is said that some children have had hooping-cough; so that the first thing they did was to hoop instead of cry), but in which a child had the disease before it was born. In Dr. Russell's "History of Aleppo," there is an account of a woman who had a tertian ague. This woman was with child, and she shook every other day; but the child within her she felt shaking regularly on the day when she was disposed to be quiet. She shook, for example, on the Monday and Wednesday; but the little one shook on the Tuesday and Thursday; so that *she* had one tertian, and the child another. If it had not been for this diversity, she could not have ascertained that the fœtus had an ague, nor could the doctors. What farther proves that the child had a different ague from the mother, is that Peruvian bark was given to the latter, and that it cured both her and the child; but as the child was young,—younger than its mother, I suppose the bark had more effect upon it; for it was cured one paroxysm before the mother. A gentleman informed me that he saw a similar case at a dispensary in London. The woman came shaking with ague; and the child within her shook like herself, only

at a different time. I suppose there is no doubt of the truth of the case related by Dr. Russell. There is no question about children having had the small-pox in the womb. Mr. Abernethy used to mention the case of a child that had the *disease*, though not the peculiar *symptom* of hooping-cough, before it was born. It was affected by the contagion; though, for want of breath, it could not hoop before birth; but it embraced the very first opportunity it had of doing so.

When this disease has once occurred, it is very liable to return, from common causes. Cold, wet, and, in this country, the east wind particularly, have a tendency to bring it back. Whether it will recur spontaneously, I do not know. Whether, without cold and moisture, and without an east wind, or some wind charged with malaria, it will return, I cannot say; but certainly, when a person has once laboured under it, frequently the slightest cause will bring it back. Dr. Gregory used to mention that he had seen two persons, in whom ague returned, from some common cause, after having been absent forty-seven years. Dr. Gregory also stated that it had been known to recur, after a lapse of years, at the very day and hour on which it originally began.

The existence of this disease gives an intermittent, or remittent tendency, to many other affections that may be present. Suppose a person has a disease, and that he is then attacked by ague;—the first disease will have a tendency to blend with the ague; so that he will have remissions, if not *intermissions* of it. When ague prevails epidemically, persons who are exempt from it still shew a tendency to an intermittent or remittent character, of any other disease which they may have at that period. This, however, is chiefly seen in fever. When ague prevails, or persons are exposed to the cause of ague, continued fever has a tendency to put on the remittent form; and remittent fever appears to be a combination of continued and intermittent fever. Ague is very frequently followed by rheumatism. I am not acquainted with a more frequent occurrence, than that of ague being followed by severe rheumatic pains in the extremities, or in the head. Occasionally it will alternate with rheumatism; so that the rheumatism shall cease, and the ague return, and *vice versâ*. Dr. Gregory used to mention, that he saw ague alternate with epistaxis; and in another case he saw it alternate with hæmaturia;—bleeding from the urinary passages; which bleeding, however, ceased at last; and then the ague returned, and was followed by paralysis. He used also to mention, that he saw two cases of ague continue four years; at the end of which they were cured by bark; but periodical delirium came on in its stead.

Ague is very often attended by local inflammation; sometimes by inflammatory pains of the head; sometimes by inflammatory affections of the chest, and likewise of the abdomen; particularly gastritis and hepatitis. In autumn, and in hot climates, it is the abdominal viscera that suffer the most severely; and ague is likewise very frequently

attended (when not by inflammation of these parts) with bilious vomiting, and bilious purging; and even by jaundice and dysentery. In some places (Zealand, for instance) Sir John Pringle mentions that ague is called *gall-fever*. It is on account of the great irritation of the liver that takes place, and the abundant secretion of bile, that aguish diseases are thus called.

After death during intermittent fever, we often find congestion and effusion in the head, chest, or abdomen. The mucous surface of the alimentary canal, is likewise in a state of great congestion; and the liver contains a large quantity of bile. When this disease proves fatal, it frequently does so by great internal congestion; whence you find fulness of all the blood-vessels of the head, chest, stomach, and intestines; and a large quantity of bile in the liver. When the disease has continued for a considerable time, you have various organic affections;—such as dropsies, and other things which I shall hereafter mention. But when a patient dies in a paroxysm, or dies after the disease has existed only for a short time, you find decided marks of internal congestion.

The chronic form of the disease, is very frequently attended by other affections; and frequently after ague has ceased, other diseases make their appearance. It is very common, for example, when ague has continued any time, for the spleen to become enlarged. So common is this, in some places, that the tumor is called by the vulgar *ague-cake*. The tumor thus formed by the spleen, occupies the left hypochondrium; or perhaps the whole left half of the abdomen. Dr. Cleghorn, who wrote a very excellent work on the diseases of Minorca,—a work well worthy of perusal when you have time,—mentions having seen a spleen, after ague, which weighed eighty ounces. Dr. Gregory used to speak of one that weighed twelve pounds. You will frequently see this enlargement of the spleen in the case of infants. I have seen many with enormously large spleens, in infants who had been the subjects of ague.

When this affection has existed for any length of time, it is common also to see ascites, as well as enlargement of the spleen. You will frequently, likewise, see enlargement of the liver and jaundice. Enlargement, both of the spleen and the liver, is common; but particularly of the former. In the case of the spleen, the patient is for the most part pale;—he falls into a state of anæmia,—bloodlessness; while, in the case of the liver, he becomes more or less jaundiced. Very frequently you will have anasarca, as well as ascites; and not unfrequently, without any ascites, you will have anasarca; and these affections generally remain, for a longer or shorter time, after the ague has ceased. They will occasionally come on while the ague exists; and occasionally not till it has ceased; and, in the former case, they are all the worse for the continuance of the ague. It was formerly imagined, that these affections arose from the ague being stopped; but this I am convinced is a mistake. Persons will have them, who still have ague very violently; and these complaints are

the worse for the ague. Patients will bear them much better if you cure the ague. The ague shatters the constitution; and renders it a more easy prey to any visceral disease that may exist. I do not believe these affections are the effect of ague. On the contrary, I am satisfied they are the result of the same cause which produces ague, and of which I shall presently speak; for I have seen people labour under enlargement of the liver, enlargement of the spleen, and dropsy of great intensity, who had but one fit of ague; and a fit which bore no proportion to the severity of these other complaints. It appears to me, that the same cause which produces the ague,—a poisonous exhalation,—produces likewise these various effects; and, indeed, they render the ague more obstinate. It is sometimes almost impossible, or quite so, to cure an ague while these affections exist; but if you remedy them in the best way you can,—by mercury, bleeding, purging, and the usual remedies of chronic inflammation,—you will frequently cure the ague without any trouble. If they arose from the ague being *suppressed*, you would not have them while the ague *continued*; and if they depended on the *ague*, and not on the *cause* of the ague, they ought to bear some proportion to its degree and continuance; but they appear to bear a proportion, in some measure, to the continuance and intensity of the *cause* of the ague. Still the continuance of ague, by debilitating the system, does make them worse.

Another circumstance, mentioned by some authors as an effect of ague, (or perhaps I should say, of the *cause* of ague), is idiocy. The faculties of the mind frequently become impaired, by a long exposure to the cause of ague. Sydenham mentions a degree of idiocy, or at least of impairment of the mental faculties, which he calls *amentia quartana*,—quartan fatuity. There can be no doubt that the continuance of ague *increases* such affections, by debilitating the constitution; but I do not believe that ague *gives rise* to them; but that they proceed from the same cause which produces ague.

Vernal, or spring intermittents, (those which make their attack between the winter and the summer solstice), are chiefly attended by affections of the chest;—that being the period at which affections of the chest are most prevalent. The autumnal intermittents (those which take place between summer and the winter) are particularly attended by abdominal symptoms;—by inflammation, for instance; and sometimes by intense bilious vomiting, purging, and jaundice. At this time of the year, too, ague has a great tendency to become continued fever;—that is to say, the excitement is disposed, not to *cease*, but only to *remit*. When the autumnal intermittents prevail, you have as many remittent fevers as agues; and some of these become continued. This conjunction most probably arises from the fact, that the causes of these various local excitements, and also of continued fever, co-exist with the cause of ague. Without any ague at all, we are all disposed to affections of the bowels, and of the stomach and liver, in hot seasons of the year; and if, therefore, the causes of ague are joined with the causes of these common affections, you will

of course have ague accompanied by these other diseases. Still it is possible that the cause of ague may be modified; so as to produce peculiar effects at this season.

Sometimes ague, so far from being accompanied by other diseases, actually puts a stop to diseases which had previously existed. Dr. Gregory used to mention, that he saw palpitation cured by ague; that the man lived afterwards for many years; and died free from the palpitation, under which he had suffered till the ague seized him. Dr. Fordyce mentions, that he has seen ague cure many diseases. In fact, ague has been thought so capital a thing, that some writers contend it never should be cured; and a proverb once prevailed that,—

> "An ague in spring,
> Is fit for a king;"—

not, however, for a *subject*, I think. You will find that Boerhaave says, in his Aphorisms, that it disposes to longevity, and clears the body from inveterate diseases. His words are,—"Cæterum (febres intermittentes) nisi malignæ, corpus ad longævitatem disponunt; et depurant ab inveteratis malis."

There is no doubt, however, that agues shatter the constitution. They shorten life; they may be speedily fatal; and if any other disease exist at the time, they for the most part aggravate it. Dr. Macculloch believes, that when they appear beneficial, it is generally not by curing other diseases, but merely by their assuming a regular type. Ague, as I mentioned before, is sometimes obscure,—does not declare itself fully; and is then called *dumb* or *dead* ague; and in these circumstances, you sometimes have extraordinary symptoms, which will disappear if the ague come on in a regular, straightforward style. It is therefore mentioned by Dr. Macculloch, and appears very plausible, that when benefit appears to arise from ague, it is from the disease having existed previously, but in so strange a manner, as to produce all sorts of symptoms; and from its having all at once become regular. It cannot be one thing and another thing at the same time; but when it becomes regular, then, for the first time, a person thinks he has got an ague, and has lost some other disease.

The continuance of ague usually causes emaciation of the body, unless it produce hepatic, or splenic disease, and dropsy; and then the body will look bloated; but still it is pale, and evidently greatly diseased. It is even said that (in some parts of Flanders, especially) ague has a tendency to produce obesity; and sometimes very rapidly; but I imagine that the fat cannot be what people call *good* fat. There is a sort of bloated blubbery fatness; and when it is remarked that such a person has got fat, people will shake their head, and say it is not *good* fat. This, I think, must be the case in Flanders; and it is said that this obesity will occur there, whether the disease has been acute or is chronic; and when there is no suspicion whatever of organic disease. It is said, too, that if the disease return there, or if

the seasons be very unhealthy, and a patient becomes emaciated, the obesity returns when all this is over. Many fat Dutchmen live in places where malaria prevails; but still they do not look healthy. The ill effects of the disease are so manifest, that no one who has an ague, ought to be much displeased with the doctor for curing him of it. Oliver Cromwell, and James the First, are said to have died of ague, caught in London. Dr. Caius says, that so fatal was ague in London, in the year 1558, that the living could hardly bury the dead. Bishop Burnett says, in his "History of the Reformation," that so universal was it in London, and so contagious, (though that was a mistake) that it raged like the plague. Sydenham and Morton both tell us it was the most fatal disease in London, from 1661 to 1665. In our *untoward** expedition to Walcheren, in no more than five weeks,—that is to say, during the last week of September, and the whole of October,—our effective force was reduced by ague, or by remittent fever,—aguish disease, to one-third; and ten thousand men died of what was called *Walcheren fever;* which was neither more nor less than an *aguish* fever.

If it should so happen that a much worse disease than ague is arrested by its occurrence, we might allow the latter to go on; but I never saw such a case; and even then I should be inclined to stop the ague gradually; and to use, at the same time, the remedies calculated to remove the other disease. For example, ague, I suppose, is preferable to phthisis; and if a patient were actually in a state of consumption, and the consumptive symptoms ceased on the occurrence of ague, one might be disposed only to *mitigate* the ague, but not altogether to *cure* it. However, I never met with any of these cases. A very eminent man, Dr. Wells, (one of my predecessors in St. Thomas's Hospital), fancied he had good ground for suspecting, that phthisis and ague were opposite; so that where ague prevailed, there was no phthisis; and *vice versâ*. It really appears that there is something in this;—that ague does lessen the tendency to phthisis; but still the matter is not so important as Dr. Wells imagined. The opposition of one disease to the other, is nothing like what he fancied it to be. You will see the question argued by Dr. Southey, in a book on Consumption†; in which he has taken great pains to collect documents from aguish parts; and proves that there is phthisis enough in those parts. I have seen several persons die of phthisis, while they had more or less ague. Some have carried Dr. Well's opinions so far, as to send a patient, who was half-dead with phthisis, to stand in a ditch at night, in order to catch an ague.

With respect to the effects of ague, you will find one shewn in the

* Future readers may not understand the political allusion here. It refers to the first "king's speech" delivered to the British Parliament, after the victory at Navarino; in which speech the destruction of the Turkish fleet is called an "*untoward* event."

† "Observations on Pulmonary Consumption; by Henry Herbert Southey, M.D."

countenance. The face in ague, and long after, is often very peculiar. It is of a dirty straw colour; and is so well characterized, that it has been called *aguish face.* The face is not yellow, nor of the colour of *clean* straw; but presents a sort of *dirty* straw-coloured look. Without the occurrence of ague, the mere residence in an aguish place gives the same hue; so that it is the effect of the *cause* of ague.

I shall now speak of the *causes* of ague; and among the predisposing, must be first mentioned bad health. If a person be out of health in any respect, he is more likely to be affected by the causes of ague; just as is the case with respect to all other diseases. A general weakness of body, independently of the presence of any particular disease, must have the same effect. High health, in general, is certainly one of the best safeguards against it. The father of the late Dr. Gregory, who was one of my preceptors,—the physician, who wrote two very excellent works, (distinguished by refined ideas, and a high tone of moral sentiment), entitled, "A Father's Legacy to his Daughters," and "The Duties of a Physician,"—used to mention that when he was a student at Leyden,—for then, if persons wished to get a good medical education, they were obliged to go to the Continent,—there were twenty-four students who always dined together, and were very much in each other's society. Twenty-three of them regularly, every day, drank a bottle of claret each; but one confined himself to water. The twenty-three escaped; while the poor water-drinker caught an intense ague. This strikingly exemplifies the advantage of keeping up the vigour of the body, when persons live in an unhealthy situation. It was *claret* which they drank,—not *port;* but that was quite sufficient to keep up a degree of excitement of body, and strength of mind, which enabled them to resist the disease. Depression of spirits will have just the same effect, as too low living. Any thing which lowers the body at large, will have the same effect; whether it be over-exertion of the body, or of the brain or mind (whichever you choose to say); or the want of good food and cloathing, or of pleasurable excitement of mind; or the presence of any thing which can depress the spirits. It is said that the effects of the mind were seen at Walcheren; and probably they were, from this circumstance. When the men arrived there, all full of the hope of military glory, they for some weeks continued healthy; but at last, when they saw that there was nothing to be done,—that the expedition would fail, they soon became the victims of disease. It is to be considered, however, that latterly they had much greater fatigue to go through; and the longer they remained there, the more they were exposed to the morbid cause of ague; but still, when they lost all mental excitement, by the failure of the hope of what is stupidly called "military glory," they nearly all fell victims to the disease.

The good effects of wine, in keeping up the strength against this disease, are shewn in the fact, that people find it indispensable in the marshy parts of France. They cannot resist ague there, unless they drink wine. Sir John Pringle mentions, that wine and full diet

are the best safeguards against it. The Dutch are in the habit of exciting themselves, by taking spirits, before they go out in the morning; and it is highly necessary,—exposed as they are to the exhalations of their putrid ditches.

Though all ages appear liable to the disease, infancy and extreme age are less liable to it, than the middle period of life. Certainly the greater number of persons whom I see labouring under ague, are neither infants, nor those much advanced in years. It is to be remembered, however, that persons in the extremes of age, are much less exposed to the *cause* of ague than others. Women, too, less frequently have ague than men; but I should think this arises, not from the female constitution being less liable to it, but because (from spending a greater portion of time at home) females are less exposed than men to its cause. Sir Gilbert Blane states that, during the ten years he was physician to St. Thomas's Hospital, he had one hundred and ninety-two cases of ague; only thirty-three of which were in females.* I made an estimate of my cases of ague at St. Thomas's, during a period of five years; and found that I had one hundred and forty-two cases, of which only twenty-three occurred in women.

It would appear that persons who have not been exposed to the cause of ague, are more liable to suffer, when by chance they are exposed; for those who had formerly lived among agues, if exposed at any subsequent period, will often escape, while the others suffer. Hence it is said that some farmers, in aguish parts, have made fortunes by marrying a succession of wives from healthy districts. Coming fresh upon an aguish part, they have been taken hold of by the malaria; and a good, *kind* husband has been enabled to look out for a second, and a third, to *love*. However, although persons may become habituated to it, (as they may to any thing else), yet it more or less injures the constitution; so that those who live in aguish parts, unless they are well fed and in good spirits, suffer more or less. They seem to be gradually poisoned by the causes of ague; although these may have not been sufficient to excite ague itself.

The *exciting* cause of ague,—the true indispensable cause of it, I believe to be an exhalation from decaying vegetable matter; what is sometimes called *phyto-septic matter*, *vegeto-putrescent matter*, *miasm*, *marsh-miasmata*, or *malaria*. However, "marsh-miasma" is an improper expression; for though it will come from a marsh, you may have it without the existence of any marsh at all. It is said that the causes of ague were not known to Sydenham, or to Stahl; and that they were first assigned by an Italian author (Lancisi), in 1717. It is said that neither Boerhaave, who wrote in 1747, nor Baron van Swieten, who wrote a few years afterwards, were aware of the cause of ague. Dr. Cullen, however, from extensive reading, satisfied himself that there was but one real cause of ague; and that it was the exhalation which I have now mentioned. The ancients

* See his paper on "Intermittent Fevers," in the third volume of the "Medico-Chirurgical Transactions."

were quite aware that marshy districts were exceedingly unhealthy. The least acquaintance with the classics, will furnish you with lines enough to prove this.

The reasons for ascribing aguish remittent, or intermittent fevers, to these exhalations from vegetable matter in a state of decomposition, is that the disease prevails in the neighbourhood of marshes; that it declines in proportion as marshes are drained; and that it rarely appears in any one, who has not been evidently exposed to the exhalations of decomposing vegetable matter.* Every one has heard of the ague of the low countries,—of Flanders; every one has heard of the aguish fevers of the banks of the Ganges; every one has heard of the ague of the fens of Lincolnshire, the hundreds of Essex, and the lower parts of Kent. I mentioned that the disease is not by any means confined to marshes. It springs up around marshes, where persons are exposed to their exhalations; but every spot which contains decomposing vegetable matter, may excite the disease. On this account, I should prefer the term *malaria* (which, indeed, is now generally used) to that of *marsh-miasmata*.

It is not mere moisture which produces the disease; for there is no ague, however wet the weather may be, till swampy land is approached, or exhalations arise from a swampy part. No drenching by rain, will produce it; unless a person has had ague before, or has been exposed to malaria. But when a person has once had ague, taking cold (whether there be moisture or not) may re-excite it; or may render the system susceptible of the effects of malaria, which it had resisted before. In the thick fogs on the banks of Newfoundland, people never experience ague. The waters there come from the gulf of Mexico; and are called the gulf-stream. They are from six to ten degrees higher in temperature, than Newfoundland; in consequence of which the vapour which passes from the water, is immediately condensed. There is, therefore, a constant fog; so that the fishermen who reside on the great bank, are six months employed in fogs so great, that they can hardly see from one end of the ship to the other. But though they are thus constantly enveloped in moisture, they are never known to have the ague. There is more rain in the western, than in the eastern parts of England; and yet the inhabitants are not proportionately unhealthy. On the contrary, it is on the eastern side that ague particularly prevails; as I shall mention hereafter. So much with respect to mere moisture.

With regard to exhalations, I may mention that Minorca, though it has a rocky bottom, and no marshes, is nevertheless subject to ague; because, in different parts of the island, there are pools of stagnant water. Much vegetable decomposition takes place in the stagnant pools; and the island is in the same predicament as though it were marshy land. The soil of the Campagna of Rome, in the most fatal season, is dry; but then the Campagna is intersected with

* Dr. Fletcher attributes marsh-miasmata to exhalations, not from *decomposed*, but from *diseased*, vegetables. See the "London Medical and Surgical Journal," for June 3, 1837.

ditches and drains of water, quite sufficiently impregnated with vegetable matter to explain the aguish fevers of that country. The fevers of Egypt begin with the subsidence of the Nile; and those of Bussorah with the subsidence of the Euphrates; and the Arabs, to revenge themselves upon the inhabitants, once let loose the waters, and thereby produced a disease which destroyed fourteen thousand persons. In Artois, in Flanders, the south and south-west winds come over swamps; and though the part itself is not swampy, they bring aguish complaints to it; but as soon as the wind sets in from the sea, and from the north, these aguish complaints all disappear. I may mention that these north winds, which do not come over swamps, are accompanied by very dense and durable fogs; but no ague occurs from them. The same is the case in many parts of France and the Mediterranean. In 1528, the French army, in attempting Naples, was reduced from twenty-eight thousand to four thousand men;—simply from choosing an injudicious encampment near the Baiæ. Infinite is the mortality occasioned in this way, by ignorant or careless generals, from encamping an army near a marsh; and by governments, from permitting marshy lands to continue in the neighbourhood of cities. The instance of Walcheren, must ever be a disgrace to the government of this country. "There was no reason apparent," says Dr. Macculloch, "for perpetuating Calcutta; when, almost from the very hour of its foundation, by Charnock, its destructive situation had been demonstrated. That Holland should have persisted in inhabiting that Batavia, which it had studied to render more poisonous than nature had already done, by the model of its own pestiferous forefather, is a problem which Holland must be allowed to explain, as it best can."

But although moisture is not the *cause* of ague, yet moisture is indispensable to the decomposition of vegetable matter; and to the disengagement of the miasma. Decomposition requires a certain degree of moisture; and if you dry any thing thoroughly, whether it be a vegetable or an animal production, you prevent decomposition. A certain degree of moisture is necessary for the fermentation and putrefaction of vegetable matter; which fermentation and putrefaction give rise to the exhalations that produce ague. Hence, in a moderate swamp, you see why dry weather may put a stop to the disease;—namely, by putting a stop to putrefaction. You also see why, in extremely wet situations, there is often no ague;—because too much fluid also impedes putrefaction; but this wet, by dry weather, may be reduced to just sufficient swampiness for vegetable decomposition to take place, and malaria to be produced. Just as dryness would prevent decomposition, so will extreme wetness and moisture. If the matter which is to be decomposed, be diffused in a very large quantity of water, the putrefaction ceases, or is not evident; so that some places which, while very wet, were healthy, have been made unhealthy by being dried just sufficiently for putrefaction to go on vigorously; and again, other parts which were dry, and which never gave out any exhalations, have been caused to do

so, by a certain degree of moisture falling upon them. Thus you see that, according to situation, the same additional moisture may produce an ill, or a salutary effect. High grounds, therefore, may suffer from the same cause which removes all unhealthiness from *low* grounds. A certain degree of rain falling upon *high* ground, will not all remain there, but will roll down. Still it has moistened the parts sufficiently for decomposition to take place above; whereas, when it comes on the *low* ground, and there collects, it may be so abundant as to dilute all the vegetable matter, and prevent it from putrifying; and may so put a stop to the unhealthiness of the part. In this way an aguish fever, whether intermittent or remittent,—for I intend to include both when I say *aguish fever*,—has been put a stop to by inundating a swamp; and on the other hand, inundation has moistened a dry part sufficiently for exhalations to take place.

By recollecting this, you may explain a number of circumstances, which otherwise would appear contradictory. A river, by breaking loose over a marsh, has sometimes prevented it from being any longer the source of noxious exhalations. Where there was a marsh before, it has produced a sort of lake. In Batavia, for example, the rainy season is comparatively healthy; because the rivers and canals are then plentifully supplied with water, which flows on rapidly; and all the marshes are inundated. But in the months of July, August, and September, the waters are nearly evaporated; and fever is then much more malignant than at any other period. On the western coast of Africa, and in some of the West India islands, especially Barbadoes, fevers are rare during the long continuance of dry weather. There is not much water there, and what there is, is evaporated in dry weather; so that the vegetable matter becomes too dry for putrefaction. Fevers, on the western coast of Africa, are observed to be arrested in long *drought;* whereas, in Batavia, they cease during the *rainy* season. At Charles Town, in South America, (which is a swampy situation), bilious fevers prevail in hot summer weather; but in 1752 there was very intense heat, and universal health prevailed. The thermometer was 98° even in the shade; and the air was glowing; all vegetation was parched up, and decomposition was put a stop to by the intense heat. In summer, fevers frequently prevail in certain parts, on account of the rivers diminishing to a great amount. All rivers, of course, diminish in summer; but some lose a very considerable portion of their depth; or rather, we should say, of their breadth. The lake Bivière, in Sicily, loses two-thirds of its dimensions in summer; the lake Cagliari, in Sardinia, loses much; and so does the Caspian Sea. Of course, the sides of a river are always more or less dry; but in summer a great portion becomes half-dry. There is just sufficient moisture for decomposition to take place; and therefore ague prevails when the rivers are shallow.

A change in the course of a river, may drain a marsh completely; and in that way a part has become healthy, which before was exceedingly unhealthy. Sometimes the very reverse has taken place.

By breaking over dry land, it has caused sufficient moisture for putrefaction to go on. The sea has done the same. It has sometimes produced the greatest unhealthiness in a neighbourhood, by making its way upon the country, and producing a permanent swamp; whereas, in other cases, it has produced something more than a swamp;—it has deposited such a body of water, that no exhalations could be given out, although before they were emitted in great abundance. The Godwin Sands are an instance of a cured marsh, though the land is lost. An immense deposit of sand has filled up the marsh. The retiring of the sea will frequently cause agues; by leaving a marsh only, where the part was previously deluged.

As every river carries down a quantity of solid materials, so every river has a tendency to fill up its bed. It becomes more or less filled with solid matter, coming down from high land. A river may be completely filled up; so that the banks must be raised, or the country will become inundated. A marsh will be produced; and great unhealthiness take place. This is frequently remedied, for a time, by embanking a river; so that it shall still be confined within its proper bounds. I say "for a time" only; because the higher the river becomes, the more slowly it runs, and the less it drains the country; till at last it is useless. But in some countries people are prejudiced, or careless; and parts which were exceedingly healthy, become the seats of the most dreadful disease. There is an instance in Switzerland, of a part becoming very unhealthy to all around. Aguish fevers extend from the lake of Wallenstadt, over a great district, as far as Zurich. A river there (the Linth) pours its water into another river (the Mag); and that again into the lake. The Mag became stopped up, through neglect; and the neighbourhood all round, a few years ago, became one of the most pestilential districts in Switzerland; six thousand acres being thus converted into a marsh. At last the authorities had their attention forced to it; and it was remedied simply by turning the Linth into the lake, instead of allowing it to empty itself into the Mag; and by widening and deepening the Mag. The lake being a deep spot, receives all that comes down from the mountains; and the whole has now a free course. The obstinacy of the people,—in living in the midst of a pestilence, when they had it in their power to remedy it,—is hardly to be conceived; but it is no less true. I could give you ten thousand illustrations; but they all come to this point;—that a certain degree of moisture is necessary to the disengagement of malaria; that if you diminish the moisture, you diminish the malaria in one case, and increase it another; and that if you increase the moisture, you may also produce either of these effects. Thus it is that, according to situation, circumstances the most opposite, will have the same effect; and circumstances which are exactly the *same*, will have the most *opposite* effect.

But a certain degree of moisture, is not all that is necessary;—

there must also be a certain degree of temperature. We can preserve anything from decomposition, by an exceedingly low temperature; and by an exceedingly *high* temperature, we produce such changes that no decomposition can take place. We know that if meat be spoiling, we have only to cook it, and the putrefactive process is immediately arrested; and so it is with respect to the putrefaction of vegetable matter. A certain degree only of temperature is proper. If the temperature be increased, then you may have extreme decomposition, and disengagement of malaria; so that while the cold weather lasts, the people will be comparatively healthy; but when the warm weather arrives, the decomposition is such that the most fatal fevers prevail. Hence it is that aguish diseases are far more severe in hot countries, than they are in ours; and that they are far more severe in autumn, than at any other period. This, at least, is one reason; but there is another. In hot countries, and in hot seasons, there is far more vegetable matter to decompose. This is certainly to be taken into the account; but when we consider that an increase of heat produces a great increase of decomposition, we also see that fever must greatly be ascribed to the facility, with which decomposition goes on in a warm temperature. A low temperature, however, may be short of that which is sufficient to stop the disengagement of malaria; and, therefore, if a country be very unhealthy, and very swampy, you will in cold weather have aguish diseases. The cold is not such as to stop putrefaction; and the land is so moist, as to produce a very considerable disengagement. The reason that ague prevails so much in the spring, is that the soil, which was caked and dried by the cold of winter, is now moistened; and the temperature of the weather has increased. The cake has consequently been broken up; and therefore you will have vegetable exhalations in abundance. The vegetable matter, which was left on the ground the preceding autumn, becomes decomposed by the increased temperature. The reason that ague is so fatal in the *autumn*, is that the summer has produced a fresh stock of vegetable matter. The surface of the earth is covered by vegetable matter; it is in great part dying, and lies upon the ground to rot; the rain comes in the hot period; and what with the heat, the moisture, and the dead vegetable matter, exhalations of course take place. The great abundance of the vegetable matter to be decomposed, together with the heat, renders the autumnal fevers far more severe, and far more numerous, than the vernal.

The effect of moisture has frequently been seen, in a striking way, when rain has begun suddenly after a dry season. When a quantity of vegetable matter has been lying upon the earth, and has become caked, a sudden rain has been attended, on many occasions, by the most fatal diseases. From the moistening of the vegetable matter, putrefaction has instantly taken place; and exhalations in abundance have been emitted. Again, the reason that, when the autumn is over, these fevers cease, is that the greater part of the vegetable matter has

been decomposed; and the temperature of the atmosphere falls; and therefore is there not only less matter to putrify, but the temperature is not sufficient for putrefaction to go on with vigour.

Pasture lands, from being constantly moist, are very aguish; and yet on breaking them up and cultivating them, they are infinitely more so; and this from the same reasons that I have now mentioned. All pasture lands must be unhealthy; for they are all moist;—and they cannot be good if not moist; for the grass will not grow without moisture. But when you break them up, you make them more unhealthy; because you kill all the vegetable matter in them. Before, there were only portions that died; but when they are broken up, nearly all the vegetable matter is killed. This rushes into putrefaction; so that it is always found, that the breaking up of pasture lands is attended by far more disease, than existed before the land was so broken up. It may be a fact, however, that malaria is let loose from the earth by breaking it up. It is said that, in many countries, on the breaking up of the surface of the earth, these fevers are sure to prevail. It is said that, in the West Indies for instance, this process has been known for two centuries to be exceedingly dangerous. Cassan mentions that fevers, like the plague, will take place on land being broken up; so that labourers will sometimes die on the spot, if they remain there all night; whereas no harm arises if they be not broken up. Volney, the traveller, mentions this as an invariable observation in America. It is found also,—and the fact is precisely similar,—that on clearing away woods, the disease especially prevails. A quantity of malaria is let loose from the forest, when the woods are cleared; and more than that, a quantity of vegetable matter necessarily lies on the surface of the earth; which, although kept moist enough for decomposition, is prevented from decaying much, from the inability of the sun to penetrate to it; but on clearing the wood, the heat of the sun is admitted to the surface, where the vegetable matter is lying; and it then falls into a state of rapid decomposition. Hence it is found that the clearing of woods is always a dangerous process; and it may be so from two circumstances;—first, the malaria which is pent up in the woods is let loose; and, secondly, the sun has access to the vegetable matter which lies on the surface, and effects its decomposition. Besides, much vegetable matter must be killed by the process. It is said that the same effect will take place in Italy, if certain bushes be cut down. Whatever malaria may be in them, has then an opportunity to escape; and fever prevails to a certainty. The removal of woods has frequently been injurious, in another point of view;—by removing a protection. Some villages have been free from ague, while a wood existed between them and a marsh; but on cutting down the wood, they have become from that moment exceedingly unhealthy;—the wood having served the purpose of a screen. Some have imagined that it was the knowledge of this circumstance,—of this advantage of woods,—that caused them to be so venerated, and held so sacred in ancient times.

It has been said that stagnant water alone will produce ague, without any vegetable matter being in it; but we are to remember that this stagnant water will putrefy; which it certainly would not, unless it contained animal or vegetable matter. Water itself,—pure oxygen and hydrogen,—cannot undergo putrefaction; but soft water will putrefy; and as that is the case, it must contain dead earthy matter. If stagnant water therefore, although nothing can be seen in it, does produce ague, we may explain the occurrence by supposing that it contains vegetable matter. It is well known that the Thames water, however good it may look, when put into casks will putrefy; and it is said that the decay of the interior surface of the cask, is quite sufficient to explain this;—that if you put pure water into a cask, yet the wood of the cask being vegetable matter, and being next the water, becomes more or less acted upon by the water; and more or less undergoes the process of putrefaction, and so affords malaria. It is on account of this liability of the wood to be destroyed, that casks are always charred within; by which they are enabled to resist the putrefactive process.

Any portion of water, however small the collection, containing decayed vegetable matter, is sufficient to cause intermittent fever. Many places, therefore, which have only a small pond, or a small lake, produce disease. Many places, no doubt, are suffered to give ague, and aguish diseases, from circumstances which are entirely within control. It is said that an inveterate ague was produced by the canal at Versailles, though it was little larger than a fish-pond. Monfalcon quotes an instance of a fish-pond at Chantilly, which was remarkable for its pestiferous character. Many country residences, there can be no question, have been made unhealthy, from the custom of ornamenting them with woods, and little lakes of stagnant water,—*pièces d'eau d'agrément*, as the French call them;—*lacs artificiels*. Edinburgh is now any thing but favourable to ague; but there was formerly in it a lake, called the North Loch, which was famous for it. Agues prevailed in that district till the spot was drained; but now no agues are there at all. When I say "ague," I mean fevers of an aguish character,—whether remittent or intermittent; and many diseases of this description are unquestionably mistaken, every day, for real typhus. In order to the existence of ague, the situation need not be low, nor need there be a marsh. At whatever height water be hemmed in, of course vegetable decay may take place; just as though it were situated low.

Clayey soils are the most favourable for these fevers, on account of the clay retaining the moisture; whereas gravelly soils let it escape. You might imagine, perhaps, that the Delta of the Nile would be a great source of ague. Ague, Sir James Macgrigor says, is not unknown in Lower Egypt; but it is only seen sporadically. The reason of this is, that there is no stagnation of water; notwithstanding the existence of so much vegetable matter as is brought down to the Delta. In fact, there is so much agitation, as to have the same effect as too much water; so that putrefaction does not take place. Strabo

remarks the healthiness of Lower Egypt; and ascribes it to this cause. On the other hand, ague will continually occur in spots, where there is little more than a pool, or a puddle; but then the water is completely stationary. Even a ship may contain a source of malaria. I believe the fevers of ships, are very often *remittent* fevers; but are mistaken for *typhus*. They have often arisen entirely from the bilge water. Captain Smith says, he never knew fever in any of his ships, during a long service in the Mediterranean; and Captains Parry, Cook, and Sir Henry Baynton, all succeeded in preserving the health of their crews. They all had the holds of their vessels washed out daily, by means of plugs, till the water came out perfectly clear; so that no accumulation of filth could take place;—no accumulation of vegetable matter. This fact may be contrasted with one relative to the Powerful, a seventy-four gun ship; the crew of which, on their voyage from the East Indies, were nearly all disabled by fever; and the cause was found to be merely the ballast, which consisted of moist and putrid mud. Ships laden with sugar have the greatest mortality; and sugar is a vegetable matter. In fact, the most unhealthy cargo that a ship can carry, is sugar.

The castle of Flamandville, in Normandy, is situated high; but an endemic prevails around, in consequence of a mere moat, containing a quantity of vegetable matter, which gives forth pestiferous effluvia. A family, resident at the place for a length of time, was at last exterminated; but before that, they underwent a loss both of mental and of corporeal power. The same thing has been observed in the neighbourhood of many castles. The besieged and the besieging have both suffered, when the baronial castles were attacked; and the source of all the disease, was the moat surrounding the castle. The sentries were the first attacked. Down to the middle of the last century, one-third of the inhabitants at Bourg en Bresse were incapacitated; in consequence of the ditches, around the fortifications, containing a quantity of decayed vegetable matter. At Havre de Grace the soldiers were once known to be giddy, and to experience violent headache, five minutes after they had approached the ditches; and then they had violent fever. I saw several cases of ague in London, arising from the moat around the Tower. A stupid negligence, with regard to the moat, prevailed for a long time; a great accumulation of filth took place; and I continually saw patients with ague, from that part of London. The first case I met with, was that of a lady;—a relative of a medical gentleman in the neighbourhood; and not having been in the country, she could not imagine how she had contracted the ague. At last she told me, that she was in the habit of taking exercise on the ramparts of the Tower; and the circumstance of the moat, of which I had read so much in books, immediately occurred to my mind. I inquired whether it was in a filthy condition; and learned that it was so; but that the authorities would not cleanse it out. One department thought it was not its business; and another that it did not belong to its jurisdiction; and some medical men laughingly said, that it could not be supposed

they should press the subject; because it brought "grist to the mill." I believe, however, that in consequence of the representations of the profession it has been cleansed out.

Harbours, moats, and mill-dams, have all been sources of ague. In a mill-dam the stream is rapid; but the sides may be flat and wet. Flax-grounds have frequently been proved to have given origin to the same disease, in consequence of the flax lying upon the ground, in a state of decay. In Italy and Germany, fevers frequently prevail in the neighbourhood of flax-grounds; and these are instances of ague in dry, sandy, high places, owing to the hemp being dried there; and the fevers regularly cease, when the season for drying hemp is over. Indigo-manufactories have also been the sources of this disease. The inundation of a cellar, has frequently caused these fevers to prevail in a family; and the passage of a drain under a house, has frequently caused the inhabitants to continue the victims of fever;—that is to say, the house has been rendered unhealthy; and all the people residing in it, have been more or less attacked with fever, from time to time. Nay, the removal of stores has frequently been productive of fever. The water, under the stores, has been impregnated with vegetable matter, in a state of putrefaction. The removal of the stores has let loose the exhalations, which were pent up beneath them; and the men employed in removing them, have been known to suffer an attack of fever.

When we consider the peculiar susceptibilities of different individuals to the effects of morbid causes, we shall not be surprised that persons will occasionally catch an ague, from the most trivial exposure to malaria. We know that some persons are singularly liable to be affected by particular causes. Many persons, on approaching a hay-field, will be seized with asthma; particularly if the grass be sweet-scented. I believe it is not the hay which produces the affection, but the flower of the grass; so that they are attacked if they approach fields at the time they are in flower; which is at the period of hay-making. It is said to be not at all uncommon, for persons to be so affected from ipecacuanha. Some persons have been seized with asthma, from ipecacuanha being powdered in the house; nay, it is said that some persons have been seized with it, merely from a box of ipecacuanha lozenges being in the same room. At any rate, a trivial exposure to this drug, frequently produces the disease. We must have seen persons thrown into a violent salivation, from a grain of calomel; nay, I have seen it arise from the application of a little red precipitate ointment, or mercurial ointment, to a sore leg. From these various circumstances, we must suppose that there are some people, who are peculiarly susceptible of the effects of malaria; and therefore I can imagine sporadic cases of ague to take place, from a person merely passing through a market, in which decayed cabbage leaves may be lying. We all know that there is more or less putridity in these vegetable remains; they continually emit a noxious smell; and I can conceive that, even in a most healthy town, you may thus have a cause of ague. Ague is

sometimes ascribable to very common and trifling causes! without at all invalidating our general conclusions. A very slight collection of decayed vegetable matter may be supposed sufficient to produce ague, in a person extraordinarily disposed to it; and therefore, when we cannot account for the existence of the affection, from a person having been near a swamp, it is very possible that the case may be one of extreme susceptibility; that a minute quantity of putrid vegetable matter, has been near the patient; or that minute malarious exhalations have been wafted to him. And it is to be remembered that these miasmata will extend to a very great distance; and that, in very aguish seasons, places which are usually healthy, and not situated near much stagnant water, frequently become unhealthy. Dr. Macculloch's works are the best on this subject. They consist of two volumes on Marsh Fever, and Neuralgia; and one volume on Malaria.* It is his opinion,—and also that of several Italian physicians, and able military men,—that a single inspiration of malaria, may be quite sufficient to cause disease. If all this be the case, (and there is no reason to doubt it), you see that we are not by any means to reject the belief, that the disease always arises from such exhalations, merely because we can hardly tell how a particular individual, in certain circumstances, may have been exposed to them.

As to the distance to which malaria will extend, it is said that, in Italy, the ill effects of stagnant water are known to extend three miles; that they have reached from the lake Agnano, as far as the convent of Camaldoli, which is situated on a high hill. Lancisi (who first referred this disease to marsh-miasmata) says that, as thirty ladies and gentlemen were making an excursion of pleasure up the Tiber, the wind suddenly shifted to the south,—coming over the Pontine marshes; and twenty-nine were instantly taken ill;—one only escaping. They were all well before; but the wind coming over the Pontine marshes was impregnated with malaria; and twenty-nine were instantly affected by it. Dr. Lind, of Haslar Hospital, (who wrote on the Diseases of Hot Climates), says that when Commodore Long's squadron lay off the mouth of the Tiber, two vessels that were close to the shore were affected; while the rest, lying a little farther off, escaped. The difference of half a cable's length from the shore, has caused vessels to suffer or escape; yet Sir Gilbert Blane says that, in the West Indies, (and he heard the same respecting the channel leading to Calcutta), the malaria was observed to reach a distance of three thousand feet, and more. In Zealand, the distance (he believes) is far less;—owing to the comparative mildness of the malaria, and also of the temperature. It is the opinion of many authors, that the hotter the climate, the farther does the malaria extend; that if the quantity of vegetable matter be great, and the heat intense, it produces its effects at a very considerable distance; but that in cold climates, the vegetable matter and

* "Essay on the Remittent and Intermittent Diseases; including, generically Marsh Fever and Neuralgia; by John Maculloch, M.D.;" 2 vols. 8vo. Also an "Essay on Malaria," by the same author; 8vo.

heat being less, the exhalations are milder in their nature, and less copious; and therefore it is supposed by Sir Gilbert Blane, (who had great experience), that in Zealand the distance is far less, than in many other parts. He says that, at the time of the Walcheren fever, no persons on board ship were seized with the disease which was prevailing on shore, although the channel between Beveland and Flushing, was only six thousand feet wide; and some of the ships lay nearer to one shore than the half of that distance. It is the opinion of many that the malaria will not extend to any great distance. Sir Gilbert mentions, that when the ships watered at Rockford, he found that if they anchored so near the shore, as to smell the land,—the smell of land-air being sometimes very perceptible at sea,—they were affected; but if they remained only two cables' length from the spot where they smelt the malaria, no inconvenience was experienced. It is said by Lind, that at Pensacola, a regiment lost a hundred and twenty men, and eleven out of twelve officers who landed; but the whole crew of a man of war, which was lying one mile from the shore, remained perfectly healthy. However, Dr. Macculloch (who has investigated this subject more than any one else; but who has carried his views further, perhaps, than most other persons will think justifiable) believes that malaria may be conveyed to an indefinite distance. He is convinced that it is conveyed from the banks of the Thames, over the hills of Kent; even to a distance of some miles from the coast. He argues in the first place, analogically, that dogs will smell the land long before it is visible; and, on the other hand, that the sea may be smelt very far inland;—that whales or sharks may be smelt, both powerfully and offensively, as far as the spouting of the animal is visible from the mast-head; and therefore he says that, if these things can reach such a distance, and odours produce such an effect, so may malaria or vegetable exhalations. He mentions that fogs and clouds go, of course, to an immense distance;—that it is a fact that malaria easily unites with fogs and clouds; and therefore he concludes, that as far as these will go, so far may the malaria extend. Moreover he asserts, as a fact, that he has found records in ships' books, of malaria having produced fever, at a distance of five or six miles or more from shore; and that the danger was instantly made sensible by the smell; so that the ship's crew would go below, or weigh anchor and run to sea. He says it is well known, that points in the coasts of Suffolk and Norfolk, and the eastern coast of Scotland, have ague; though there is no local source of malaria for many miles, and that there are some points where there is no source of malaria, for even a greater distance than that; and therefore he contends that it must be brought from Holland, and the northern shores of the Continent.

The effect of the east wind, in causing and renewing aguish diseases, is well known; but it can no more be the simple air itself, than pure water (oxygen and hydrogen) can produce ague. Wind, if pure, can no more be poisonous than pure water; and therefore the noxious property must be, as in the case of water *contained* in

it. Now the east wind is perfectly innocuous, in the regions which it reaches after having passed over healthy countries; and, *vice versâ*, other winds are as unhealthy in some parts of the world, as the east wind is here; that is, where those winds come over a marshy district; exactly as our east winds do. This is another argument adopted by Dr. Macculloch. He says,—still pursuing his argument,—that land under the trade winds, and ships in the equatorial seas, escape; and that St. Helena, being so much exposed to the east wind, ought never to be free from ague; whereas that is not the case. If the east wind blows over a frozen continent, or simply blows across the sea, (though of course, in its passage, it must imbibe moisture), it is found to do no harm. In order to be injurious, it must blow over land, where there is vegetable matter and moisture. For this reason, in one-half of the globe, the east wind is exceedingly injurious from the month of March to the month of October. In French Flanders, the south and south-west winds do the same harm, as the east wind in other countries. The east wind in summer is dry. Hence it has less conducting power; and thus, though we get ague from the Dutch ditches in *spring*, we do not get their remittent fevers of *autumn*. The east wind is so dry at that time, that it will not conduct the malaria; for a certain degree of moisture is as necessary for its conveyance, as for its production.

To shew the healthiness of the east wind, where it does not pass over a marshy district, I may mention that it is the salutary breeze of the burning islands of Western America; while many parts of France, Germany, Poland, and Russia, never feel its injurious effects. Dr. Macculloch says, that although "the east wind, after sweeping the burning sands of Africa, makes the side of Sardinia which is exposed to it a desert, and in Minorca will not suffer an orange leaf to protrude beyond a garden-wall, it is before the *east* wind that Mount Edgcomb roots its splendid trees even into the sea; —not daring to shew a leaf to the *western* ones; while in Southampton river it is precisely the reverse."

The *east* wind, from its excessive heat and dryness, or from its coldness and moisture, may be injurious in other ways than in producing intermittent fever. The Harmattan will not produce ague; but it is excessively hot and dry, and therefore an injurious wind. Again, all experience an unpleasant feeling from the east wind in spring;—not by its producing ague, but by its being excessively cold, and excessively moist.

Distant parts suffer more if they be hilly than if flat; and frequently the immediate neighbourhood of a marsh will escape in some measure, while a village or a town at some distance, if it be situated on a hill, suffers exceedingly. This fact seems to be capable of explanation, from the circumstance of hills attracting from the clouds their moisture, and every thing united with it. Malaria being conducted by moisture, and moving with the clouds, and the clouds being attracted to the sides of a hill, deposit their moisture and every thing else they contain; and thus you see that a hilly

part may suffer much, although it is situated at a great distance from a marsh. I mentioned that the convent of Camaldoli, which is situated three miles from the lake Agnano, suffers from ague. It stands upon a high hill. At Malta, the malaria produced under a cliff, never affects the spot itself; but produces direful consequences on a village situated above it. At Weymouth,—in our own country,—it is said that the back water rarely affects the immediate inhabitants; while those at a distance suffer. At St. Austle, in Cornwall, the disease prevails from some marshes at St. Blaizy. At Erith there is less ague in general, than could be expected; but houses that are situated high above it, often suffer very severely.

Sometimes a distant part will suffer, not from clouds conveying the moisture, but from currents of air. The locality of a part may be such, that a current will proceed in some particular direction. If currents pass over a swamp, the part exposed to them will necessarily suffer; and if there be a peculiarity in a current, you will have a part affected which you would not, *à priori*, expect to suffer. Captain Smith, in his "Statistical Table of Sicily," mentions seventy-six unhealthy towns and villages; and out of that number, thirty-five are situated on hills or declivities, and at a great distance from a marsh. When the wind blows from the south, being a warm wind, it has a tendency to ascend; and it is supposed that the southern wind, blowing over a marsh, and tending upwards by its temperature, affects high towns; while the colder northern wind does not affect those houses situated on the other side of the swamps, though placed equally high. We can easily conceive of a swamp, and towns on each side. When the wind blows *sonth* it will ascend, and high houses will suffer; whereas, if it blow *north*, it will not ascend to a house of the same elevation; but will remain near the earth; and in that way the house will suffer very little, or not at all. Hence you are to take into account a number of circumstances, when you see ague prevail in districts, where there is no marsh in the immediate neighbourhood.

There are some singularities, however, in the prevalence of this disease, which cannot be explained. At least many, perhaps, will not be satisfied with the explanation that is given. It is said that, on the high road to Chatham and Feversham,—comprising a distance of twenty miles,—the effect of malaria is only noticed on one side of the road. The injurious lands which afford the malaria, are situated about a mile off; but it is only detached houses on one side of a level road, that suffer. It is to be remembered, however, that the dews will spread in a similar way;—that they will spread to a particular spot, or stop at a certain bush. Every one may notice the same circumstance, in the case of a hoar frost. Now, as far as these will extend, so may malaria; and they will explain the singularity of such an occurrence, in some instances. Dr. Bancroft was credibly informed, that only one side of a particular street in Rome, was affected by ague or aguish diseases; and Baglivi says that the healthy spots of Rome, are separated from the unhealthy by a won-

derfully short distance. A similar circumstance is observed in Cadiz; and in many American states. In the latter, however, the reason is perfectly evident;—some streets are exceedingly low; and are built in districts near which there is a quantity of stagnant water.

It is in consequence either of the weight of these pestiferous exhalations, or of their uniting with moisture, and producing their effect when the moisture is deposited, that the lowest spots are generally the most dangerous; and this also accounts for these exhalations being most dangerous at night; for it may be laid down as a general rule, that malaria is most dangerous in a low situation, and in the night. It is on the ground, and near the lowest parts of a house, that moisture is deposited; and that being the case, the exhalations of malaria will be let loose there; and what is lowest will suffer most. Again, in the night the cold is greater than in the day; and from the cold being greater, moisture is deposited, and with the moisture malaria. Hence we have, in general, a sufficient explanation for the two facts I have just stated.

I could give you plenty of instances of the influence of difference in elevation, in causing a liability to ague. In the Spanish Town barracks, in Jamaica, there were three cases of fever in the *lower* story, for one in the *upper*. Sir Gilbert Blane says he was informed, by a medical man, that in 1781, at St. Lucia, one regiment, situated on the *top* of a hill, lost two hundred and seventy-one men, from intermittent and remittent fever; another regiment, on the *sides* of the hill, lost three hundred and eighteen; and a third, which stayed at the *bottom* of the hill, lost four hundred and eighty-six. The hill was called *Morne Fortuné;* and was situated eight hundred and seventy-two feet above the level of the sea. At Walcheren, the natives knew that those who slept in the upper stories, were far less liable to disease than those in the lower; and that if they caught ague, it was much milder. Sir Gilbert Blane also says he was informed, by Dr. Ferguson, that at St. Domingo, two-thirds more were taken ill on the *ground* floor than on the *upper* floor. In Italy the difference is so great, that an *erect* is known to be more safe, than a *sitting* or a *lying posture*. Although this is a general rule, however, yet there are exceptions to it. In some parts of Norfolk, danger is confined to the *upper* stories; but in those places there must be a particular current, which wafts the malaria in that direction.

The great danger of night, is always strikingly illustrated. Dr. Lind says that, in 1766, two hundred and eighty men who were landed at St. Thomas's, from the ship Phœnix, suffered; and all but three died. The ship's company likewise went on shore, in parties of twenty or thirty; and rambled about the island; but none of these who did not remain at night, suffered. Dr. Lind mentions that, at Batavia, a boat belonging to the Medway, was actually manned three times; every one having perished; and simply from the men having to attend duty on shore, every night. It is found that a cold night after a hot day, is much the worst. During the

heat of the day, there is more disengagement of malaria; and consequently when night comes on, there is far more to be precipitated. Cold and wet are always most operative after heat. It is thought by some that, in Italy, evening is more dangerous than night; and that there is no hazard after nine or ten o'clock at night. If this be a fact, I presume it arises from the whole quantity of malaria being by that time deposited. The effect of night, however, must be ascribed in some measure to mere sleep. It is right to take every thing into consideration; and all morbid causes act more powerfully in sleep, than in the waking state. Sleeping on damp ground at night is injurious; not merely because the person has lain upon the ground, nor simply because he has lain there during the night; but because he has lain on the lowest spot, at a time when there is more malaria than in the day-time, and when the body is less capable of resisting it than in the day.

Lind and Mungo Park were convinced, that malaria was precipitated with the rain; and in this way they noticed, frequently, that rain was unhealthy. Park says that, on one occasion, the rain had not begun more than three minutes, before many soldiers seemed drunk, and fell asleep; while others vomited; and he mentions that, in a storm, he himself felt disposed to sleep; and could not help it, although he was on damp, and therefore dangerous ground. Dr. Lind says, that the most unhealthy rains in Guinea, are those which occur first in the wet season; which looks as if malaria were precipitated in the rain; that in forty-eight hours, the rain rotted their shoes; and that when the clothes they had on, were hung up to dry in the sun, they became, in a few hours, full of maggots; shewing, probably, that much injurious matter was contained in the moisture, and deposited with the rain. As the rain falls more and more, there is generally less and less unhealthiness. This may be ascribed to two circumstances;—in the first place, to the quantity of malaria deposited by the first rain; and, secondly, to the continued rain which falls upon the earth, and producing so much moisture, that vegetable decomposition will not so easily go on. Hence, again, disease increases when the moisture declines.

I may mention, that the power of moisture to dissolve these exhalations, is rendered exceedingly probable from the fact, that a stench arises from pools and privies in damp weather. Every thing that affords an offensive smell, becomes worse in wet weather; and therefore the exhalations that produce ague, will also probably rise far more in wet, than in dry weather. The effect of moisture is sufficiently seen in the increase of illness.

It has been thought by some, that a mixture of salt water with fresh, prevents this injurious decomposition. However, this is a mistake; for those salt marshes, which are principally situated in the south, will give rise to ague in summer. For instance, around the Dol, in Normandy, where there is a salt marsh, scarcely an inhabitant escapes ague. Very often there is a severe intermittent fever

in Holland, after an inundation of the sea; and even when a place is well washed,—as Herne Bay, for instance, and the district around Reculvers,—aguish fevers frequently prevail. On the other hand, it has been contended, that a certain portion of sea water *augments* the prevalence of this miasmata. This would be not at all to be wondered at; because it is a mere hypothesis that salt water prevents it. Sea weed, being vegetable matter, has actually been the source of fevers of this description.

It is very probable that certain plants, and certain soils, are more favourable to the production of malaria than others; for sometimes there is malaria in spots where you would not suspect it;—where the grass looks fresh and green; and where you observe no signs of decomposition; whereas, in other parts, where there is a degree of decomposition, persons are perfectly safe. A friend of mine, who was travelling in Syria, saw a spot of grass fresh and green, though rather moist; and he intended to pitch his tent there for the night. But he was warned by some of the people of the country; who rode in haste to him; and implored him, as he valued his life and the lives of his retinue, not to pitch his tent there. He could not conceive why; and they told him that whoever remained on that spot at night, was sure to be seized with severe fever. There was nothing in the appearance of the grass, that could lead him to suspect any thing of the kind; but, of course, the lower portions were constantly dying and decomposing. It is, as I have just said, the opinion of many, that certain soils, and certain varieties of vegetable matter, are peculiarly favourable to the production of this malaria. Such would appear to be the fact; and very possibly is so; but whether this is to be attributed to the nature of the soil, or to the existence of certain plants, rather than of others, I do not know. Some believe that the different kinds of ague, arise from a difference in the vegetable matter. It is said, for instance, that tertians particularly prevail in Germany; that in Italy quotidians are most frequently seen; that in Hungary, fevers of this description are particularly attended with petechiæ; and the exhalations of the Pontine marshes, are said to produce fevers with short intermissions. Holland is remarkable for producing all sorts of fever;—quotidians, tertians, quartans, and every other variety. In Spain, Africa, and America, these fevers are remarkable for being attended with black vomit, and with yellowness of the skin. In some parts of Italy, these fevers are particularly attended by apoplexy; and in many parts they are particularly followed, or accompanied by neuralgia. In India and Africa, the *liver* chiefly suffers; at Walcheren the *spleen*. Even parts not distant from each other, are sometimes thus distinguished. It thus appears that there are many peculiarities, according to situation; but whether this is to be explained by a variety in the malaria, I do not know.

There is one description of bog, which does not produce malaria;—namely, peat-bog. But here there is no putrefaction; decomposition having taken place in a peculiar manner. The vegetable matter be-

comes carbonized; and there is not sufficient heat for putrefaction to occur. But it is said that peat-moss, when in a certain latitude, and on a certain level, can putrefy; and then, I believe, ague does prevail. That peat-bog does not putrefy, is shewn by a fact stated on good authority; namely, that animal matter thrown into it will not putrefy; but it is said that where peat-moss is placed in situations where it is warmer, and upon a proper level for moisture, it will putrefy and produce ague, just as other kinds of vegetable matter will do.

Now that it is *vegetable*, and not *animal* matter, which produces ague, is proved by this circumstance;—that no person has this disease from being exposed to the most intense animal exhalations. Thousands of carcases are annually employed in many manufactories; as, for example, in sal ammoniac manufactories; and yet no person is known to contract an ague from them. Indeed, so far from it, that the most crowded places generally escape intermittent fevers. That part of Rome inhabited by the Jews, and called the *Judaicum*, is full of animal filth; but it escapes ague; while the elegant streets in the neighbourhood, suffer from it very severely.

Fire and smoke, especially tobacco-smoke, appears to keep away ague. Malaria not being the produce of dead *animal* matter, or effluvia arising from living bodies, but of vegetable exhalations, the more men and animals are crowded together, the less access is there for the malaria; and it is generally supposed that the addition of smoke, of every description, has a great tendency to prevent it; and therefore those who live in the most smoky, crowded, dirty places, are situated in the most favourable manner with respect to ague. It was once imagined, however, that the smoke of coal was particularly injurious; and therefore it was made a capital offence to burn coal in London; and forges were only allowed in the vicinity. Sir Gilbert Blane mentions that, in the Tower, there is a document relating to a person who was executed in the time of Edward the First, for burning coal in London; though it has since been considered to be a great promoter of health. Perhaps smoke, whether of coal, or wood, or of tobacco, may act by merely taking the place of the exhalations, and preventing them more or less from entering. It may be, however, that they act by their warmth. Napoleon, when with his army in Italy, was in the habit of employing fires, to a great extent, to keep away malaria; and he did it with great success. But here the heat must have been useful, by dissipating moisture and cold. Dr. Lind mentions, that when the Edgar ship of war was off the coast of Guinea, in 1765, the crew were very sickly, and many of them died from fevers of this description; but in the crew of a sloop of war which always accompanied her, very few were ill, and none died. In the latter there was a fire for cooking, on the same deck where the men lay, and which filled with smoke the spot where they slept; whereas in the Edgar, from the particular arrangement of the vessel, there was no smoke whatever between the decks. Here were two ships off a country which afforded a vast quantity of malaria.

The crew of the one remained healthy; and that of the other became diseased, in the way I have stated; although the only difference between them was that, in the former, the part where the men slept was constantly, or almost constantly, filled with smoke.

It appears quite certain, that intermittent and remittent fevers are not contagious; though formerly ague was considered to be so. Dr. Fordyce, who was almost one of our own day, says (both from his own knowledge, and a reference to the opinion of others) that ague is contagious. Dr. Cleghorn, in his work on the Diseases of Minorca, says the same. Dr. Wells, a colleague of Dr. Fordyce at St. Thomas's Hospital, accounts for the opinions of the latter by remarking, that he (Dr. Fordyce) fancied that *continued* and *intermittent* fevers, were mere varieties of the same disease; and as it appeared, in those days, that continued fever was contagious, so he was obliged to maintain that *ague* was contagious. Dr. Cleghorn's mistake is supposed to have arisen from his having observed, that most of those who were about the sick, in Minorca, had the disease; forgetting that it did not arise in consequence of emanations from the sick, but from the situation in which they were placed. Of course it is no proof whatever that a disease is contagious, that you catch it from going to see a person labouring under it; for he may be in the very spot where he contracted it, from local circumstances; and in going to him, you go to the spot which has given *him* the disease; and which may therefore give it *you*. In order to prove that a disease is contagious, there should be a sufficient number of instances of persons going from the place where they contracted the disease, to a healthy part; and there giving it to others. There is no reason whatever to suppose that agues are contagious; though, formerly, not only were *they* supposed to be contagious, but even *scurvy* was also pronounced to be communicable to others.

The chemical nature of malaria, or marsh-miasmata, is unknown. It is not carburetted hydrogen; and no known chemical substance has the same effect. The air of marshes is said not to differ chemically from the air of any other part, with respect to its quantity of oxygen. There is no reason to suppose that it is a deficiency of oxygen, or an excess of carbon, or the presence of carburetted hydrogen, that renders the air pestiferous in this case. It is said by Dr. Leisle, that malaria has no smell. Thus much, however, is known;—these exhalations may be suspended by aqueous vapour. Indeed, it is said that they never rise but with some lighter body;—that they require to become so suspended, in order to rise at all. Being, however, suspended by aqueous vapour, they are even more deleterious than contagions; for, like contagion, a momentary application is sufficient, in many cases, to produce the disease; and, unlike contagion, they may be wafted, and produce their effect at a very great distance; whereas contagion spreads but a very short way, and after a certain distance is destroyed. Malaria, like other gaseous bodies, very easily finds a barrier; so that, in Italy, a gauze veil is

said to be efficacious in preventing its effects upon the human body. On this point I can only repeat what I have read.

If these exhalations be very strong, they may kill instantly. Many allow that fever may begin in half an hour after exposure. Occasionally the exhalations have been so intense, that labourers, in France and Italy, in breaking up the ground, have died on the spot. Other persons have been seized with giddiness, and some have even died, on looking into a ditch, or a drain, around which aguish fevers prevailed. Persons, who have been scarcely exposed to the deleterious exhalations, have been immediately seized with vertigo, vomiting, and syncope; and from that moment have had regular intermittent, or remittent fever. But usually their effect does not occur till a certain period has elapsed. In South Carolina it is said, that eight or ten days is the shortest time which elapses, between exposure and the appearance of the disease. The reason for so long an interval may be, that there is less heat there, than in many other parts. Dr. Wells believes that the autumnal agues of that country, do not appear till spring; —that is to say, the agues which we see in spring, are the result of exposure in the preceding autumn. He founds his opinion on the fact, that strangers visit South Carolina in the spring, with perfect impunity. Dr. Lind mentions having seen these fevers take place, the very morning after exposure. Dr. Bancroft gives an instance of the disease occurring instantly; and then other cases, which did not take place for many, even for nine months. Dr. Bancroft likewise ascribes the agues of spring to the previous autumn; and for this reason. He says that he has seen persons seized with ague, after they have returned to England from a warmer climate, where they had been exposed to miasmata; and that they have experienced the disease at too early a period in the year, for it to have arisen from malaria, at home. Probably, the earliness of the period at which ague occurs, is in proportion to the intensity of the heat, and to the quantity of moist vegetable matter. It is certainly very common, in England, for harvesters who have worked in aguish districts, and have been exposed to the exhalations in autumn, not to be affected till the east wind blows, in the following spring. I have seen very many cases of persons, who have left an aguish part in perfect health. and have remained so for some time,—even for months; when by chance getting wet through, or being exposed to a cold damp wind, they have been seized with ague. Dr. Maculloch doubts these long intervals; but I have seen them in too many instances, to entertain the least doubt whatever.

By habit persons become rather insusceptible of the effects of these exhalations; by habit they cease to have ague when exposed to malaria; or if they do have it, it assumes a very mild character. This is very commonly observed, in what are called the *pernicious* districts of Italy, France, and Sicily; in which districts those persons, chiefly, are susceptible of its operation, in whom glandular disease has been induced. To shew the effects of habit, I may men-

tion that General Monnet (a French officer) found that, in a malarious situation in Walcheren, there was only one-half the sickness in a regiment, during the *second* year, that there had been during the *first;* and that during the *third* year his men remained at the place, there was no sickness whatever. The inhabitants of one marshy district, when they go to another, suffer less than strangers;—less than persons who have gone to a marshy district, from a place that was perfectly healthy. A physician in my parish used to relate a story, from his own knowledge, of a party going up the Thames; of which party only one lady caught an ague. She had always lived in Edinburgh;—a high, dry, healthy spot; while all the rest of the party were inhabitants of a malarious place.

But it is said that one unhealthy place does not, by any means, *always* give indemnity to an individual who goes to another; and that a place to season an individual perfectly for another, must be situated between the tropics, and not have a cold winter. It is found, for example, that Gibraltar will not season a person for the West Indies; but then Gibraltar is not situated between the tropics. Such a seasoning as would render a person altogether insusceptible of the disease, can only be obtained between the tropics; where we can conceive malaria to be produced in the most intense degree. It is also to be remembered that, when a person has once had ague, he is very liable to a return of it from a slight cause;—such as from the blowing of a cold, wet, east wind; or from getting wet through; or from being, in any way, thrown out of health. He is rendered liable to have the disease renewed from slight causes; but altogether he is much less sensible to the influence of malaria.

Whether persons, however, have had ague or not, if they be constantly exposed to malaria, the constitution is impaired. They acquire a dull heavy look, and are bloated; or they are emaciated, shrivelled, pale, sallow, and weak. Sir Gilbert Blane says that the people residing at Walcheren, were far less subject to aguish affections, than strangers; but that they all looked sickly. Yet these Dutchmen would not allow that their climate could be unhealthy; and when they saw one-half of the English sick, through their noxious climate, they would not allow that it arose from the filthy ditches; but ascribed it to errors of diet, and the bad habits of the English. The liver and spleen are much disposed to become diseased; and dropsy to supervene. In the worst vallies of Switzerland, poor persons are shrivelled; young persons look old; and middle-aged persons appear in the greatest state of decrepitude. In these vallies, there is always a great quantity of malaria pent up. Indeed, so great is the injury produced by malaria, that whereas the average of human life in England is fifty years, in Holland it is only twenty-five. In some parts of France, which are very pestiferous through the malaria, you will find that the greatest average age is twenty-two; while in some it is only twenty and eighteen; and in others it is only ten. In some parts of Africa, and the East and West Indies, the average is as low as this. Yet many persons, who have not been

previously exposed to malaria, escape it as well as the Dutch, who have been accustomed to it. The Dutch, who live in the midst of it, will not allow it to be unhealthy; exactly as a person of dirty filthy habits, believes himself to be as clean as is necessary. Persons, however, although well-informed on these matters, will frequently, when they come to an unhealthy place, be obstinate, and act the part of mules; and many such have suffered for it. You will find it stated in "Captain Clapperton's Voyage," that the Captain himself, Mr. Pearce, Dr. Morrison, and Mr. Houlton, a surgeon, while on an expedition to Africa, lay all night on the banks of a creek, when there was no occasion for it; and the next night they lay in a market-place, though there were houses enough for them to have entered. The following day, Captain Clapperton was seized with fever; Dr. Morrison was seized in two days more; Captain Pearce the next day. Lander, their servant, was seized next; Mr. Pearce and Dr. Morrison died soon; and Mr. Houlton and Captain Clapperton died ultimately. They were all warned of the dangers of thus exposing themselves. You will every day find instances of this awful obstinacy; —this total disregard of human life. Because the Dutch are obliged to have dykes and ditches in their own country, they have surrounded themselves with them, when there was not the least occasion, in the East Indies;—merely, I suppose, to be like their brother frogs at home.

It is said that, in very unhealthy places, even brutes are known to suffer. Dr. Macculloch says he heard that a dog, at Guernsey, had a tertian ague; but whether this is correct, I will not pretend to say. He adds that epizootic diseases frequently prevail at the same time with marsh-fevers; and that in St. Domingo, the dogs are always the first affected.

Malaria is the constant scourge of the earth;—not the *occasional*, but the *constant* scourge. It produces not only fevers, but very frequently dysentery, cholera, and sometimes neuralgia; and it causes an intermittent or remittent character to be given to other diseases; and even when it causes no positive disease, it undermines the health. Malaria abounds to a frightful extent in Greece, Italy, France, America, Asia, and Africa. We know nothing of it here, compared with the violence of its ravages in those parts. However, it was once far more injurious in this country than it is now; but from the energy and industry of the English character, such extraordinary improvements have been made in every thing to promote the well-being of man, that nothing abroad can be compared with our advantages. You know that Southwark was once an entire swamp; and at Westminster there is a toll-gate, called the "Marsh-Gate," from being situated in a place where formerly (and not very long ago) there was a marsh. From the improvements that have been made, however, ague is now comparatively rare in London. It prevailed to a great extent before the fire of London in 1666; but from that time the place was better drained; so that the fire did good, as no doubt the cholera will do. Before the fire, ague raged like a plague.

Between 1667 and 1692, no less than two thousand persons died in London of dysentery, arising no doubt from the same cause as ague. So great, however, has been the reduction, that in 1728 there were only forty-four deaths from ague; in 1730 only sixteen; and in the bills of mortality for the first ten years of the present century, there are only four deaths from ague recorded. Within the last five or six years, agues have increased through the country, and in London; and this may be easily explained. They have not increased to what they were formerly; but still there has been an increase. Sydenham says that they disappeared in London from 1674 to 1678; and they disappeared in Plymouth, Huxham says*, from 1755 to 1760. They were absent from Portsmouth for three or four years. They returned again in London epidemically in 1751, 1753, and 1754. Sydenham says that they returned again from 1677 to 1688; and they also prevailed at the beginning of the last century. These are all accidental occurrences. It has been said by Dr. M'Michael, of the Middlesex Hospital, that during the few years that ague prevailed so much, the average heat was greater than when it disappeared. The heat being greater, of course there was more vegetable decomposition. To show the increase of late, I may mention that in 1823 I had but eight cases of ague; in 1824, I had fourteen cases; in 1825, fifteen cases; in 1826, forty-four cases; in 1827, fifty-three cases. The number then declined; so that in 1828 I had but twenty-seven cases; and in 1829 I had only eight. If we had accurate accounts, we should perhaps find that when ague increased in former times, the average heat was higher than usual; just as it has been observed to be by Dr. M'Michael, during the last few years that ague has become prevalent again.

Persons who have once had ague, or who have it upon them, are much disposed to exhibit a more or less aguish form of any other disease under which they may labour;—that is to say, when a person is the subject of ague, it is very common for diseases to become more or less intermittent; and this is especially noticed in aguish countries. Rheumatism, ophthalmia, vomiting, and purging, may all be intermittent, and even periodical. However, it is quite certain that, independently of malaria, many diseases will become intermittent. Insanity is sometimes intermittent. I have seen a person mad once a-year, or once in three years. Palsy is likewise occasionally intermittent; and in one case I saw it periodical. It came at a particular hour in the day; but the patient had had ague, many years before. Dr. Macculloch, however, ascribes a vast number of diseases to malaria†; but there cannot be a doubt, I think, in any one's mind but his own, that he has carried his ideas to an extravagant pitch. He has done great good by attracting the attention of persons to malaria, more than it was before; and his writings are very powerful and learned; but I think no one can read his publications without perceiving, that he had one idea constantly before him. That idea was

* "Observationes de Aére et Morbis Epidemicis Plymuthi factæ."

† See his Treatise on Malaria, already referred to.

malaria; and he ascribes infinitely more to it than reason can justify. However, notwithstanding I am satisfied of the extravagant length to which he pursues his ideas, yet I am equally satisfied that too often we do not ascribe diseases to malaria, when they really arise from that source. We frequently meet with sporadic cases even of ague, which cannot be easily traced to malaria; but I have no doubt that, if we could ascertain all the circumstances, we should find that the individual has a striking tendency to it; and has been exposed to malaria by passing through a market, or some other place, in which there was vegetable matter in a state of decay. It is also to be remembered, that though the influence of malaria is so great, yet cold and wet, and other causes of debility, will induce ague, without the reapplication of malaria, when a person has once had it. Sometimes, too, when malaria has been applied, the disease does not occur till such circumstances as these have taken place. I mentioned, in my introductory remarks, that the *predisposing* will sometimes become the *exciting* cause. The exciting cause of ague is unquestionably malaria; but sometimes it will only act as a *predisposing* cause; for it will lie dormant in the system till the person gets wet through; in which case the latter is really the exciting cause. From all the circumstances, I am convinced that many cases are aguish, where there is no suspicion of their true nature.

The proximate cause of ague,—the real essence of that state which is always present when the symptoms occur,—is unknown. We can say, with certainty, that it is a peculiar state; for a person, in the intermission of ague, is perfectly well. There is frequently no disease to be found, whether inflammatory or anything else, of any particular organ. Again, ague frequently cannot be removed by antiphlogistic measures; though occasionally it certainly may; as well as by anything, in fact, which makes an impression on the system. Again,—inflammatory diseases are not cured by sulphate of quinine, and remedies of that description. The disease *may* be inflammatory, and often *is* so; and requires antiphlogistic measures; but its *essence* is not inflammatory;—at least I know no proof of it. It may be inflammatory; but there must be something more than inflammation.

It is impossible to say how it is cured by the measures which are specifics in the disease;—as, for instance, bark. It cannot be by curing inflammation; neither can it be by irritating the stomach. Some have affirmed that bark only acts by irritating the stomach; but if that were the case, brandy and cayenne pepper would do just as well; and so would corrosive sublimate. Nor can I conceive that specifics operate by strengthening the patient. We might give a person full diet, and take care that he has regularly exercise, and improve his strength in every way we can; yet we should not cure his ague; whereas a few grains of quinine,—a quantity too small to strengthen the body directly,—continually puts a stop to it. I cannot pretend to say how it is that remedies act in curing the disease; but of this I am satisfied, that it is not what people pretend it to be. The remedies do not cure it, as people allege, by strengthening, or

by stimulating, or by any similar operation. We can only say there is a peculiar state; and that remedies cure it by a peculiar operation. This is, I acknowledge, saying nothing; but, at any rate, it is not advancing unfounded hypotheses; and fancying ourselves wise, when we are really ignorant. Arsenic, which cures ague very well, is not a tonic. It will debilitate the body; cause it to tremble; and depress the powers of the system; and yet a small quantity will stop the disease. Why a remedy of this sort is called a tonic, I do not know.

As to the diagnosis, we sometimes have a little difficulty in distinguishing ague from hectic. Hectic is a disease which continues for a length of time; and so may ague. It is called *hectic*, from being placed in the habit (εξις); being a *continued* disease;—that is to say, lasting for a length of time. It also resembles ague in another respect;—it is more or less intermittent. In hectic, however, the rigors are irregular. All the stages, too, are irregular;—one comes before the other, without any sort of order. After a time, in hectic, there are no rigors;—nothing but sweating, constant feverishness, and a quick pulse; and this feverishness is excited by taking food, and by the slightest quantity of nourishment. There is generally profuse sweating on dropping asleep;—the moment the patient drops asleep, some part of the body is in a sweat. In ague, when the sweating is over, the person is comparatively well; but in hectic, so far from being better, the patient feels weaker. In hectic, there is a red patch on the face, the palms of the hands, and the soles of the feet; the tongue is moist, and generally red. In the urine there is not the lateritious, red, brick-dust sediment of fever; but a pink deposit. In hectic, there is not the exposure to the cause of ague; and there is not the aguish face;—that peculiar cast of countenance, which is so often seen in ague. In hectic, there is frequently a local disease;—suppuration in some part of the body; and there is an exacerbation at night, and frequently at noon.

No one of these symptoms alone, will enable you to distinguish the disease; because ague is sometimes irregular;—recurs at no certain time; and is, perhaps, even almost *remittent*; so that you may have to make the distinction between *intermittent* and *remittent* fever. In ague you may sometimes have profuse sweating, and little else. It is therefore necessary, in making a diagnosis, to take all these circumstances into consideration; and if you do, you will, in ninety-nine cases out of a hundred, be correct. Now and then, however, there may be a little difficulty. Sometimes you have ague and hectic together. I have seen hectic in a person labouring under phthisis; where there were rigors, increased heat, and sweating, from ague; and increased heat and sweating from the suppuration; so that really the case was one of difficulty. There was at the same time, the aguish face; so that it would have been difficult to make the distinction between the diseases, had I not known there was suppuration in the lungs. The aguish face, and the circumstance of having been exposed to the cause of ague, shewed that probably ague was present; but the suppuration also shewed that hectic fever

was present. If you take pains with your cases, you can rarely be deceived. Now and then there will be a difficulty; but that will occur in instances where the hectic fever is attended by great rigors; or where, on the other hand, ague is assuming a *remittent*, rather than an *intermittent* character; and the patient has a local affection. You must also remember that rigors will occur without ague or hectic. Many persons, from mere nervous debility, will experience rigors; many persons will not be able to do their business, and their teeth will chatter, merely from depression of mind. Again, persons with a stricture are subject to rigors. Some persons always have rigors when a bougie is passed; and without that, simply from a stricture in the urethra, many will experience the same. If you find the rigors come on suddenly, and there is a stricture in the urethra, you ought to doubt whether there is ague. When rigors occur from stricture, or some other disease of the urethra, there is generally no heat or sweating. Neither is there the aguish countenance; nor can you ascertain that the individual has been exposed to malaria. If, however, you still have doubt, after all your inquiries, it is best in all cases to give the remedies for ague. If they be properly managed they can do no harm;—at any rate the sulphate of quinine can do none. The diagnosis of *intermittent* from *remittent* fever, is an easy matter. It is a mere circumstance of degree. If there be a *perfect* intermission, we call it "ague;" if it be *imperfect*, we call it "remittent fever."

The prognosis in ague, in this country, is almost always favourable. You may almost always promise a speedy cure. If there be conjoined with the ague a local structural disease, of course that part of the prognosis must stand on its own foundation; but the ague itself you may generally cure. If its type be quartan, you cannot promise so speedy a cure, as if it be tertian or quotidian; and I believe you are placed under the same restrictions, if the disease be autumnal and not vernal. An autumnal ague does not yield so readily as a vernal ague; and, indeed, the latter usually yields so easily, that it often ceases spontaneously, after a few paroxysms;—some think after seven. It generally ceases when the warm weather comes in; and will frequently do so on a person changing his residence. You will recollect it is the ague of *spring*, and not of *autumn*, that is fit for a king. There is a contrary proverb for *autumnal* ague:—

"Febris autumnalis
Est longa aut lethalis."

In hot climates, and even here, many *intermittent* fevers become *remittent;* and from being remittent they will become *continued*, unless vigorous measures are adopted; and may prove rapidly fatal, by congestion of the head, thorax, or abdomen. It is in hot countries, and in hot weather in this country, that we have to give a guarded prognosis. In hot countries it is common for patients to die early in the attack, in consequence of the enormous congestion which occurs in the head, chest, or abdomen. Now and then this

may be the case here, from some peculiarity in an epidemic. We have always to consider, therefore, in giving a prognosis, whether there is any peculiar form of ague present; and if that be the case, and if it be a form that is sometimes fatal, our prognosis must be more or less guarded; although, without that, we should give the usual prognosis. We have no idea, in this country, of what aguish fever, remittent or intermittent, is in hot climates. In Italy, they are called *pernicious* fevers; for as soon as a person is seized, he may fall into a comatose state, from which he never recovers; and, on inspection after death, the greatest degree of congestion is found in the lungs and head, and also in the abdominal viscera. In this country, however, we may almost always promise, not only a *cure*, but a *speedy* cure; and that by means not at all severe;—*tuto, cito, et jucunde.*

The means which we employ for the purpose of curing intermittent fever, may be divided into those which are had recourse to in the *intermission* of the disease, and those which are employed during the *paroxysm.* With regard to the latter, the greater number of them are adopted rather with a view to the temporary *alleviation*, than to the *cure* of the affection; and I need not say that they must be very different, according to the stage in which they are employed. In the *cold* stage, common sense would point out that there should be plenty of covering, and warm drinks; and some have recourse to the warm bath. It would, however, I conceive, be better to employ dry heat; for warm air may be easily and instantly conveyed to a patient when in bed, by having something under the clothes to raise them, and a tube continued from above a spirit lamp. Thus you surround the patient with hot air; and you may convey it in any quantity you please, and of any temperature. Something like an inverted funnel is placed near the bed, with a spirit lamp under it; a tube goes from the extremity of this funnel-shaped body, and is conveyed under the bed clothes; so that the air is dispersed throughout the bed. The degree of heat may be regulated, by altering the proximity of the lamp to the funnel. I think, if the cholera should make its appearance amongst us, this will be found by far the best mode of applying heat externally*; and on this account, particularly;—that when you employ vapour, the patient for the most part must be in a sitting posture; or at any rate must be taken out of bed, and more or less exposed after the bath. But, in extreme exhaustion, it is a material thing to avoid all this, and to keep the

* Since these observations were delivered, the cholera *has* made its appearance among us; and the contrivance indicated was extensively employed. Having been led to the subject, we may notice the admirable manner in which heat was applied externally, in the Cholera Hospital at Edinburgh. Every bed was furnished with a hollow "tin-mattress" (as it was called); which could, at any time, be filled with steam, by means of a pipe which communicated with a boiler. This hospital, besides the unwearied services of Dr. Mackintosh, enjoyed the advantage of being superintended by Mr. Meikle, surgeon in the East India Company's service; who brought to the task an extensive acquaintance with the disease in India, and the experience derived from repeated attacks of it on his own person.

person horizontal; and by using the contrivance I have mentioned, you need not take him out of bed, or remove him from the horizontal posture. Heat may thus be employed, to an extent sufficient thoroughly to warm the surface; and friction, especially to the extremities, may be had recourse to at the same time;—just as grooms rub shivering horses, on the legs, and even on the ears. If it be right to apply heat, during the intensity of the cold stage of intermittent fever, I imagine that this contrivance will be found much better, than either the hot water or the vapour bath.

Warm liquids, of course, appear to be indicated; but you should be on your guard against administering real stimulants. It is very well to apply caloric by means of hot liquids; but by giving stimuli (such as brandy and wine) you incur the risk of doing more than you intended;—of increasing the subsequent hot stage; of inducing delirium; and causing congestion and inflammation of the head, and internal organs. I should therefore give hot diluents, or at the utmost hot *spiced* diluents; rather than alcohol, or things which are in themselves *real* and *permanent* stimulants.

A remedy has lately been recommended, which one could not *à priori* imagine to be proper; but in favour of which there is very strong testimony. I allude to the abstraction of blood. The best information you can have upon this subject, is to be found in Dr. Mackintosh's "Practice of Physic." * I believe he is the gentleman who first advised, and put in practice, this mode of treatment. You are aware that, in the cold stage of fever, the circulation is greatly deranged. The internal parts are in a state of congestion; the head, lungs, heart, and all the organs the veins of which go to form the vena portæ, as well as that vein itself, and its divisions, are in a state of extreme turgescence; and by removing a certain quantity of blood, you unquestionably diminish this load. You give ease to nature; and it is found that the loss even of a small quantity of blood, relieves more or less the general uneasiness of the patient. I mentioned that, in hot countries, where they have what are called *pernicious* fevers, it is very common for those fevers to be attended by such a degree of congestion, as we rarely see in this country;—congestion which speedily proves fatal; and it must therefore be a very great point, in hot countries, to bleed as early as possible. Dr. Mackintosh mentions, that the cold stage is shortened by this practice; that the hot stage is either prevented, or diminished in violence and duration; and that many cases are entirely cured. You will find a report on this subject by Dr. Stokes, in the "Edinburgh Medical and Surgical Journal," for 1829; which is not altogether favourable. He says that venesection is more or less useless, and more or less injurious, in different respects. He says it is beneficial in removing the local symptoms; in removing the symptoms of congestion about the chest and abdomen;—which is just what one would imagine. But, he

* It is in the later editions of his work, that this subject is most fully treated. See also two papers published by him, in volumes xxvii and xxviii of the "Edinburgh Medical and Surgical Journal."

says, he was always compelled to exhibit quinine sooner or later; and he adds, as a reason for limiting venesection to those cases where there is coma or inflammation, that a friend has informed him of some patients, so treated, who never recovered. There can be no doubt, I think, that the practice is not so injurious as one would, perhaps, imagine before hand; but that, on the contrary, it frequently does a great deal of good; for it removes the local symptoms, frequently shortens the complaint, and sometimes cures it. As far as I can understand, it is, for the most part, rather a means of *alleviation*, than of *cure;* but I have no doubt that, in many cases abroad, where the congestion is extreme, it is imperiously necessary. I have never myself had recourse to it; and therefore cannot speak of it, except as a matter of opinion. I put the testimony of others together, and infer for myself; but I have no facts to give you. I have never seen a case of ague, which I thought required such treatment. I never saw a case which I could not cure by the sulphate of quinine; and knowing this, and not seeing any violent local symptoms during the cold stage, to make such treatment necessary, of course I have never employed it.

Speaking of venesection in general, and not of the cold stage in particular, Dr. Lind says that he, and two others, had each three patients with ague. Each bled his three patients; and each lost one.* This, however, is saying very little, unless we knew the particulars of the cases. Dr. Mackintosh says that it is always safe, often shortens, and sometimes cures; but as I find that I can always remedy the affection by the sulphate of quinine, in some quantity or other, I have not thought it right to take away blood, and thus impair the powers of the patient. There can be no doubt, however, that it is a remedy to which it is our duty to have recourse, if we find great symptoms of congestion; and if we fear that the next attack will prove fatal.

Opium is found both to shorten and to alleviate the cold stage. I have given it with very great success. The best authors will tell you, that a full dose of opium certainly shortens this stage, and always alleviates it; but still, if I found great congestion of the head, or of other parts, I would certainly order bleeding, in preference to opium. A tourniquet has sometimes been applied to an extremity, for the purpose of producing early excitement. One would conceive that, by this means, internal congestion must be increased. If you compress the femoral or brachial artery, there must be a larger quantity of blood thrown upon other parts; and if such a remedy does good, it must be by producing such a load, as will stir up nature to attempt its removal; so that the body will be hurried out of the cold stage, more quickly than it would otherwise have been.

When the *hot* stage comes, we have to give cool drinks; to take off some of the clothes; and to employ, if it be necessary and advisable, the tepid bath; or warm affusion, or warm ablution. There

* "Essay on Diseases incidental to Europeans in Hot Climates; with an Appendix concerning Intermittent Fevers."

would, I should think, be no harm in *cold* affusion, or *cold* ablution; neither should I hesitate to bleed in the hot stage, if there were any congestion, or any inflammation. A cure has now and then been effected, in the hot stage, by a person jumping into a pond; which is a cold bath; but I believe this is rather a dangerous practice. Opium, in this stage, has likewise been found of use. Dr. Lind says that he found opium useful in the hot stage, both in shortening its duration, and mitigating its violence. It would appear, then, that venesection is admissible in the *cold* stage, as well as in the *hot;* and that opium does good in both stages.

When the *sweating* stage has arrived, all is going on well, and the paroxysm is nearly at an end; and you then (if the patient chooses) give him warm diluents; and put on more clothes than in the hot stage, because he is gradually cooling. You must not allow a draught to blow upon him; but you may attempt to lessen the duration of the sweating stage (which will sometimes run on for many hours) by diminishing the quantity of clothes, and cooling him gradually. You must be very cautious, however. In the *hot* stage there is no danger, I presume, from tepid ablution; but in the *sweating* stage we must be more on our guard. In this stage narcotics, and every thing that debilitates, would be wrong. Nature is now exhausted, and wants repose; and to lower her still more, must be not only injurious but unnecessary; because health is about to be restored, and things are now nearly at a conclusion. If the patient be exceedingly faint, stimulants may be given; but before we exhibit them, we must take care to observe whether local congestion, or inflammation, may not be present.

The great means, however, for curing the disease, (unless venesection be considered a very important means), are certainly to be employed in the *intermission.* By the term "*intermission,*" we mean the period between the paroxysms; while by "*interval,*" we mean the period of the paroxysm and the period of intermission together. The two chief remedies, in the cure of this disease, are bark and arsenic. Nothing is more instructive, in pointing out the impropriety of hastily deciding against a medicine, than the history of bark. Peruvian bark was first brought from South America in the year 1632; but the mode in which its efficacy was discovered, has not been well ascertained. So highly, however, was it thought of at first, that in the year 1658, sixty florins* were given for twenty doses. It was then made a nostrum of, as all good medicines are; till at length many regular practitioners wrote against it; and such was the prejudice excited, that about thirty years afterwards, several hundred pounds weight of it lay at Piura, unable to find a purchaser. An alderman died, while using it to cure his ague; and it was therefore immediately asserted, that he was killed by it. Oliver Cromwell, who (as I before stated) had an ague, was not allowed to take bark;

* Presuming that the *Spanish* florin is meant, this sum will amount to about thirteen pounds sterling.

and consequently died of the affection. The prejudice against it continued to extend, and great violence was manifested. Sydenham however, though at first opposed to it, gave it boldly; and warmly advocated its employment. Violent medical altercations took place; —far greater than any which now occur; and those who employed it were called "murderers," and were stigmatised as being unfit to practise. Sydenham gave it in larger doses than his cotemporaries; and exhibited it, not during the paroxysm, but in the intermission. Now there can be no doubt that it may do harm during the paroxysm; for it may overload the stomach, and increase congestion, if given in large quantities. Sydenham, therefore, introduced a great improvement, by giving it in the intermission; and he improved its efficacy by giving it in large doses. The efficacy of many medicines is not properly esteemed, in consequence of their not being given in sufficiently large doses. Many persons will exhibit a medicine; and if it does not appear to answer, relinquish it immediately; without determining whether it will really do good or not. Sydenham, by giving larger doses than his cotemporaries, by exhibiting it between the paroxysms, and by gradually increasing the dose, found that it deserved all the praise which had been bestowed upon it.

When it does not cure the disease as rapidly as you wish, it should be given in the largest dose that the patient will bear. A drachm or two drachms every two hours, is frequently necessary to cure the affection. Dr. Gregory used to tell us he was informed by a practitioner, that a friend of his, in the delirium of ague, took from three to four ounces of bark; and not only did no ill effect ensue, but he was cured from that moment. It ought to be given finely powdered; because if it be not, a very small quantity only will come in contact with the stomach and intestines; and its full virtue is not obtained.

Of course you know, that there are three kinds of Peruvian bark; —the yellow, the pale, and the red.* The latter is preferred by many as being the most powerful; but although the most powerful, it is not so well borne by the stomach. Dr. Chapman (of New York), Dr. Sanders, (who practised at Guy's Hospital)†, Dr. Rigby, (of

* Ascribed to Cinchona Cordifolia, Lancifolia, and Oblongifolia, respectively. But although the Pharmacopœias of London, Edinburgh, and Dublin, all agree in this respect, Dr. Duncan observes that there is no satisfactory evidence of their being right;—"on the contrary, it is almost certain that, with regard to some of the species, they are wrong." Some highly instructive observations on this subject, distinguished by all his usual acumen, and never-tiring patience of investigation, will be found in his "Edinburgh New Dispensatory;" pages 372 to 387 (twelfth edition). A very complete account of the different kinds of Cinchona Bark, is given by Mr. Pareira; whose Lectures on Pharmacology, unrivalled for extent and accuracy, will be found in the "London Medical Gazette," volumes xvii to xx. Those who consult the interesting lectures of Dr. Sigmond, published in the "Lancet" for 1836-7 and 1837-8, will see what the graces of a polished style, and illustrations collected from every department of literature, can do for a subject usually considered so dry and unattractive as Materia Medica.

† "Observations on the Superior Efficacy of the Red Peruvian Bark, in the cure of Agues and other Fevers."

Norwich),* and Dr. Skeete,† all wrote on the red bark; and extolled it as being more efficacious than the others. Milk is one of the best vehicles in which bark can be given. Some give the powder in decoction; and some give it as an electuary; and it may be given thoroughly mixed with any syrup or sweet substance, and then diffused in some liquid, so as to be drunk. Sometimes it disagrees with the stomach; and therefore it is necessary to add something to it. Many persons, from pure bark, experience nausea; and perhaps vomiting; while in some, it occasions purging. In all such cases, a few drops of tincture of opium, will frequently enable the stomach and intestines to bear it. If it be only the stomach which is disturbed, an effervescing draught will answer the purpose; and so will prussic acid. A small quantity of prussic acid, given at intervals in the course of the day, will enable the stomach to bear bark, and many other things, very well. But if the intestines be deranged at the same time, opium is probably one of the best things; because neither an effervescing draught, nor prussic acid, will lessen the purging. You may sometimes bring a patient to bear bark by degrees;—giving him small doses, and increasing them. In the case of children, it may be given in the form of clysters; and some persons have been cured, it is said, by its external application;—by having it tied, in fine muslin, or fine linen, on different parts of the body. I recollect hearing Sir Henry Halford say that, when he was a child, he had ague; of which he was cured by wearing a jacket of bark. A double jacket was filled with powdered bark; and put next his skin.

It is now ascertained that the power of Peruvian bark resides in two substances, called *quinine* and *cinchonine;* and of these two the former is chiefly used; and that in the form of sulphate. It is found by chemists, that both these substances abound most in the red bark; and we therefore see how it is that the red bark was supposed, by many, to be the most efficacious of the three kinds. Quinine is said to abound most in the yellow bark,—the cinchona cordifolia; and the cinchonine in the pale bark,—the cinchona lancifolia. I have given the quinine, both simple and in the form of sulphate; and have cured ague with it very well; but I have never employed the chinchonine.

The mode of giving the quinine is usually, as I have just said, in the form of sulphate; and a few grains, every eight hours, will generally cure the complaint. Some give a grain or two, every two hours; and say it answers very well; but others give a larger quantity, at more distant intervals. Either way is very good; but if the stomach reject it, certainly it would be better to give only a grain or two every two hours throughout the twenty-four, rather than a large quantity at once. I have found it the most efficacious mode, to give a large dose immediately after the paroxysm. It is very good to give it *before* the paroxysm; but I think, of the two, more effect is pro-

* "Essay on the Use of the Red Peruvian Bark in the Cure of Intermittents."
† "Experiments and Observations on Quilled and Red Peruvian Bark."

duced by giving it as soon as the paroxysm is over. For the most part, you will put a stop to it directly, if you give ten or twelve grains as soon as the paroxysm is over; but you do not usually *cure* the disease, you only *suspend* it. To effect a cure, you must generally give a larger quantity in the course of the twenty-four hours; and for some time. When we first had sulphate of quinine, I was generally able to cure the disease with two or three grains, two or three times a-day; but that does not generally happen to me now; and therefore I cannot but believe, that this medicine is exceedingly adulterated. I continually have to give people twenty or thirty grains, in the twenty-four hours, before I can cure the complaint.

No general rule can be laid down respecting the quantity required. Some persons may be cured by a few grains; and some will require a very large quantity. In February, 1829, I had a patient labouring under quartan ague, which did not yield to less than forty-five grains, in the twenty-four hours. I thought that a very considerable quantity; but in the ensuing October, on my return from the Continent, I found a patient in my wards who, by direction of Dr. Roots, was taking a scruple every eight hours, together with ten minims of Liquor Arsenicalis.* This man, like the former, had a quartan ague; and was no better, notwithstanding he took this large quantity. However, as it did not disagree with him, and as I never failed in curing the complaint, I determined that if it *could* be cured it *should;* and I gave the remedy (as Dr. Roots would no doubt have done, had he continued to treat the case) every *six* hours, instead of *eight;* and he was then cured directly. That was the largest quantity that I have ever been obliged to give; but it was indispensable in this case. I should certainly advise you to give a large dose (such as twelve or fifteen grains, in some cases; but eight or ten, in general) immediately after the fit, to *suspend* the disease at once; and then to give a small quantity repeated at intervals during the twenty-four hours, for the purpose of *curing* the disease. In the first case you knock it down at once, which is a material point; because every paroxysm shatters the patient, and is a period of great suffering; and therefore I would stop it immediately. But you will not always stop it *permanently*, unless you give a larger quantity in the twenty-four hours; and continue it for some time. I am in the habit of giving ten grains as a medium dose, immediately after the paroxysm; and then five grains every six or eight hours, whether the disease comes back or not. It is necessary to continue the medicine for some time, after the disease appears to be cured; for if it be left off directly, the disease, in all probability, will return. It is just the same in the cure of syphilis; if you leave off mercury as soon as the sore is healed, or the pain has ceased, the symptoms will possibly return. Although ague, therefore, appears to be quite arrested, it is necessary to con-

* In the London Pharmacopœia for 1836, the name of this preparation was changed to "Liquor Potassæ Arsenitis." As we have mentioned the New Pharmacopœia, we may refer to the "Medical Gazette" for April 7, 1838 (vol. xxii. p. 78), for a notice of some errors into which all the translations have fallen.

tinue the remedy for two or three weeks afterwards, in order to make sure of your cure.

The remedy, I know, may be given with perfect safety even during the paroxysm, when the pyrexia is all present; and even though there may be local inflammation; but I should conceive that it is a waste of a good thing, to give it during the paroxysm. At that period the system is in such an unnatural state, that all agents are resisted; and a dose of quinine, that produces a good effect during the intermission, will produce no effect during the paroxysm. Medicines are all resisted, more or less, when we are in an unnatural state. It is found to be more efficacious during the intermission; and sufficient may then be given to cure the disease. I do not know that it is *injurious* to give it during the paroxysm; but it is certainly *wasteful.*

I have frequently had occasion to give it, notwithstanding there was local inflammation. My object was to cure both diseases; and while I was curing the local affection by bleeding and other means, I stopped the ague with the quinine; and never saw any harm done by it. When I first employed this remedy, many years ago, I had a patient with ague, who shivered every other day; and had then intense heat and sweating; but during the intermission he was always hot; always had a very quick pulse; and was always thirsty. He had continued fever, with the addition of a tertian ague; or he would have been said by some to have remittent fever. I did not then know a great deal about the remedy; but I gave it him at regular hours, day and night, and he became perfectly cured. Notwithstanding the great feverishness, no inconvenience arose. The case is published in the twelfth volume of the "Medico-Chirurgical Transactions," along with several others of which I made a report to the profession, before the remedy was much known in this country. I have continually seen quinine cure the disease, when bark was given in as large a quantity as could be borne; and likewise arsenic; and both had failed. I have also known it stop vomiting. When a person with ague has been exceedingly troubled with vomiting, with great irritability of stomach, I have known it put a stop to the irritability as well as to the ague. Still it is to be remembered that, now and then, it disagrees with the stomach. Now and then it produces vomiting and gastrodynia;—just as bark will do; and, more frequently still, it will also purge. When you find the stomach is disordered by it,—whether it be thrown into spasmodic pain, or vomiting is occasioned,—you may give aromatics, or opium, or (what is far the best) prussic acid. If there be mere pain, an effervescing draught will not be of any use; though it might be serviceable if there were nausea and vomiting.

In one respect it is best given in a fluid state; and there should be a slight addition of sulphuric acid; by means of which you make a super-sulphate. Sulphate of quinine is not very soluble; but by adding one drop of sulphuric acid to every grain of sulphate of quinine, you have a super-sulphate, which is sufficiently soluble. It

goes farther, I should imagine, when given in this form; but on account of its taste, and for the comfort of the patient, we often give it in a solid form. If it be exhibited in a pill, its bitterness is not tasted.

The power of quinine is one of the most extraordinary facts in medicine; and always reminds me of the lines in Virgil,—

"Hæc certamina tanta,
Pulveris exigui jactu, compressa quiescunt."

It is said to have failed sometimes; and that bark has then cured the affection; just as, in many cases, I have seen it *successful*, when bark had *failed*. I imagine that when this has happened, it has been from its disagreeing with the stomach; so that a sufficient quantity could not be taken. Cases have occurred to me, in which the stomach became so irritated, from the intensity of the medicine, that the patient rejected it; and could not take it in sufficient quantity; whereas bark, being far less intense, could be borne; and was taken in such a quantity as cured the disease. I had a case exactly of this description, in the lady who caught an ague from walking on the ramparts of the Tower. A very small dose of sulphate of quinine produced most excruciating pain at the stomach; and she could not persevere with the medicine. Bark was substituted for it; was borne very well; and cured the disease. Whether if she had taken tincture of opium, or prussic acid, in proper quantity, it could then have been borne, I do not know; but I think it probable that it might; and that it would then have cured her. I think Andral mentions the circumstance of quinine having failed, and of bark subsequently curing the disease. I do not know the particulars of his cases; but I imagine that such a circumstance as this, could only arise from the medicine irritating the stomach, so that it was not taken in a sufficienly large quantity; because it has all the virtue of the bark, and in far greater intensity.

Many other barks, however, cure the disease. The bark of willow, the alcaloid principle of the willow-bark (salacina), swietenia, all astringents of the vegetable kingdom, and more especially a combination of both, (such as columbo with galls), will cure the affection. A combination of these, is found to be more powerful than either of them taken separately; and those barks which contain both a natural bitter and an astringent, are those which answer best. It is said with respect to these, that they have sometimes cured the disease, after Peruvian bark has failed; and various other combinations of bitters and astringents, have done the same. Piperine will cure ague.

Next to sulphate of quinine or bark, however, certainly comes arsenic. The solution of arsenite of potassa, is what is commonly used; in doses of from two to ten, or twelve drops, or more, two or three times a day. It is best to give this remedy in a very gradual mode; and I never begin with more than two or three drops, three times a day;—gradually increasing it. It is always best not to give

this medicine on an empty stomach. When you are giving an acrid matter,—such as iodine, the oxymuriate of mercury, or antimony,—with a view, not to nauseate, but merely to produce diaphoresis, you find it by far the best practice to exhibit it after food has been taken. It is evident that any thing acrid, coming into direct contact with the mucous membrane of the stomach, is more likely to irritate it, than if food had been first taken, as to cause it to be so applied to the stomach partially and gradually. Whenever Peruvian bark or sulphate of quinine, irritates the stomach, it is best to try whether it will not be borne when given after meals. But in the case of arsenic, you should make it a rule never to give it before breakfast. Persons are continually nauseated, and will even vomit if they take it before breakfast; whereas, *after* breakfast they may bear it very well. When it produces nausea or vomiting, a little tincture of opium is indispensable; indeed it is well, in general, to combine a little tincture of opium with every dose of arsenic.

The ill effects of arsenic are symptoms of gastritis. The slightest symptom is nausea; the next is vomiting; then pain of the stomach, and heat there; tenderness on pressure; and heat extending up the throat. Arsenic has a tendency to excite gastritis, even when not taken into the stomach. I knew an instance of a person being seized with gastritis, and thrown into the greatest danger, simply from having arsenic applied to a sore of the leg. One of the first effects of arsenic, is to irritate the stomach; and the irritation soon arises to the pitch of inflammation; but it will also produce other effects. Singularly enough, it occasions soreness and redness of the tarsi; redness and heat of the fingers; soreness of the throat; and œdema of some part of the body. Very frequently, when patients have been taking arsenic, I have seen the face swell; and sometimes the lower extremities. Sometimes it is one part, and sometimes another; but more frequently it is the face. Frequently, too, there is heat of the system. When this local inflammation of the stomach, throat, or face, takes place, the whole body will become more or less excited; so that you have general pyrexia. In this case, it is necessary to omit the medicine immediately;—not to lower the dose, but to omit the medicine altogether; and then you generally see the symptoms decline; though it may be necessary to apply leeches freely at the pit of the stomach, or to bleed. I never, but once, saw any harm ensue; and in that case the remedy had been carried on very injudiciously. If, while you are giving arsenic, you look carefully at the patient's face, and ask about his throat, and also respecting the state of the stomach,—as to whether there is pain, tenderness, nausea, heat, or vomiting,—I believe no harm can arise.

Arsenic will sometimes cure the disease immediately. I have seen ague cease from the first day it was given, although the disease had continued for a length of time; but frequently a longer period is required, for its successful exhibition. The largest dose required, I believe, is from twelve to fifteen drops, three times a-day; or as frequently as is necessary. I never had occasion to go beyond that;

nor should I like to do so. I need not say that, on account of its virtues in this disease, it has been made a nostrum of;—exactly as was the case with bark. What is called "Tasteless Ague-Drop," is a preparation of arsenic.

It is asserted, but I cannot say from experience whether it is correct, that when Liquor Arsenicalis has failed, pure arsenic has succeeded;—that is to say, what is called arsenic in commerce, has succeeded; when its combination with potassa, according to the directions in the Pharmacopœia, has failed. It is said that about the sixteenth of a grain may be given, three or four times a-day; that the eighth of a grain can seldom be borne; but that the sixteenth of a grain succeeds very well. You will find this stated by Dr. Macculloch, in his second volume on "Marsh Fever;" but I never exhibited it. Many other minerals, which are astringents, will cure cases of this disease; sulphate of zinc, oxide of zinc, sulphate of copper and alum. Muriate of ammonia is likewise said to have a power over the disease; and it is thought by many, at least abroad, that it heightens the power of bark. Carbonate of potass is supposed to possess some virtue. A combination of some of these things is thought to be best; but no doubt sulphate of zinc, and sulphate of copper, will frequently cure the disease.

As a full dose of sulphate of quinine, or a full dose of bark, is found more useful immediately before the paroxysm, than at other periods of intermission, (except immediately after it is over), so various other remedies have been employed at this period. These have been of various kinds;—sometimes medicinal; and sometimes calculated only to make an impression on the mind. Immediately before the beginning of a paroxysm, a large dose of opium has sometimes prevented it from coming on violently. Sudorifics and emetics have been employed for the same purpose. Mental emotion has been excited at the moment with a similar view; so that a child has been flogged out of his ague, or frightened out of it by threats. He has been threatened with a good thrashing, if his ague came on; and there can be no doubt that this has cured his complaint. Sometimes by exciting disgust,—by insisting that a person should swallow spiders and cobwebs, the paroxysm has been prevented. Some persons, however, imagine that the latter really possess a power in preventing the disease. I have no personal knowledge of the virtue of spiders and cobwebs; but you will find in Dr. Chapman's work on Materia Medica,* a very strong testimony in favour of the soothing effects of cobweb. He mentions that it will procure sleep in fever, and tranquillize the system, when all other things have failed. I know that many persons declare that it has a sort of sedative quality; and there is no reason why it should not; but in the cure of ague, it has been employed merely with a view of exciting disgust; and has succeeded. These effects might be produced at any time during the intermission; but it is immediately before the

* "Elements of Materia Medica, and Therapeutics; by Dr. Chapman;" Philadelphia, 1831.

paroxysm that disgust, or fright, or violent emotion of mind, is most likely to be of use.

The great remedies for the disease, however, are quinine and arsenic; all other means being more or less uncertain, except perhaps salacine. I never think now of employing anything but quinine; though, in particular circumstances, I might be induced to order venesection. These two medicines, quinine and arsenic, are also equally good in other complaints of an intermittent, though not aguish, character. In intermittent rheumatism and neuralgia, they are among the best remedies. It is a singular circumstance; but even in intermittent vomiting, arsenic has been known to effect a cure. In the last volume but one of the "Transactions of the London Medical Society," you will find a paper by Dr. Adams, on periodical vomiting, coming on at certain intervals; which was cured by what would, in many cases, have *produced* vomiting;—a small quantity of arsenic. Whenever complaints assume an intermittent form, whether they be aguish or not, you will find that the sulphate of quinine and arsenic, are among the best remedies. If either of these failed separately, I should not hesitate to give them both together. I have failed with arsenic, but not with quinine. Whenever a case was obstinate, I increased the dose to the largest quantity the stomach would bear.

It was formerly imagined that ague was too good a thing to be cured;—that it was very wrong to stop it. At any rate, many contended that it ought not to be stopped, till the patient had gone through a certain preparation. I know that I have astonished many persons (who, when abroad, were accustomed to see some preparation employed before the remedies for ague were given) by stopping the disease immediately. I never saw any harm done by it; though if there be any local affection of the head, chest, or abdomen, you must take care to attend to that at the same time. If there be any congestion of the head, lungs, or abdomen, it may be necessary to bleed, to purge, and to use all the remedies for such a state as this; for if you do not, it is possible that the circumstance of stopping the ague at once, may be useless. If you do every thing indicated by the local affection, I am quite satisfied there will be no danger in stopping the ague. I never did harm by it in a single case. I never lost a patient from ague; notwithstanding that I gave sulphate of quinine when local inflammation was present. Arsenic, I need not say, may be very improper when the inflammation which is present affects the stomach; and in the case of gastritis, possibly neither arsenic nor quinine can be borne; and you do not remedy the morbid condition, till you adopt either local or general bleeding.

So far from the stoppage of the ague doing any harm, I have found any local disease that might be present, removed the more easily; for every attack of ague of course disturbs the circulation, renders it more irregular, and is likely to throw a greater load of blood upon those organs which are already in a state of congestion. At any rate, ague always makes bad worse. I have always con-

sidered that I have treated local complaints more successfully, by having stopped the ague. Sydenham says,—"cure the ague first; and then you will easily cure the dropsy, which otherwise might be impossible." I never saw any chronic complaints ensue, on stopping ague. I believe they do not arise from the ague itself; but are, like ague itself, the result of malaria; and I know that, for many of them, one of the best remedies is sulphate of quinine, bark, or arsenic. I have seen many cases of dropsy vanish, on the exhibition of sulphate of quinine, without any thing being conjoined with it. If you stop the ague, you will find all those effects which are ascribed to it, cured more safely, whether they be acute or chronic. Still it is possible that ague sometimes may not give way, till you have remedied the local mischief. It is said that, now and then, ague will not yield to any thing, till you make use of local bleeding. You will find many say they have met with cases, where bark would not cure the disease, till they made the patient's mouth sore. I never met with a case of that description; but still it is so asserted; and it is right that you should know it. If what is said be correct, such a practice must be adopted; but I should nevertheless, in such a case, go on with the quinine, while I was giving the mercury, or making use of local means.

With regard to the *prevention* of ague, the great point is to drain the country; and to prevent all accumulations of dead vegetable substance; in order to prevent, as much as possible, exhalations from putrefied vegetable matter. When land cannot be drained, occasional inundations may be necessary; in order to throw more water upon it, than is compatible with vegetable decomposition. With regard to individuals who must be exposed to ague, the best mode of preventing it is to live as well as possible; to have good food; a certain portion of wine or beer; and never to expose themselves to malaria with empty stomachs. Persons so situated, ought always to take something before they go out of doors; and where malaria is very intense, spirits may be found necessary. Smoking is an excellent preventive, in damp places. I mentioned that when Napoleon was in Italy, he found the advantage of keeping up good fires, in preventing disease. When persons are obliged to live in a house where there is malaria around, it is best to sleep as high as possible;—rather to condescend to sleep in a garret, than to aspire at sleeping in the best apartments; and it is of great importance to avoid going out at night, or very early in the morning. It is said that a gauze veil around the head, when persons must be exposed, is likewise of use. It might be highly beneficial for a person exposed to malaria, to take sulphate of quinine.

CONTINUED FEVER.

In continued fever, the general symptoms are the same as those I described, as the constitutional symptoms usually accompanying local inflammation. The same symptoms which occur constitutionally, in

any intense local inflammation, are those which, generally speaking, characterize continued fever. There is quickness of pulse, increased heat, and diminution of the secretions. From the latter circumstance we have thirst, dryness of the skin, scanty and high-coloured urine, and costiveness. There is usually restlessness and watchfulness. At first, as at the beginning of inflammation, and as in intermittent fever, there are the opposite symptoms of chilliness (even amounting to rigors), coldness, paleness, and smallness of the pulse; but these, in general, last only for a time. Andral, according to some observations which he made at Paris, in 1822, on two hundred and twenty-nine cases of fever, says that chilliness rarely occurs on the first two or three days. However, I have been attentive to this circumstance; and I know that people in London, at the very *beginning* of continued fever, do frequently complain,—more frequently than not,—of chilliness; and of those symptoms which are analogous to the first stage of intermittent fever. If, however, these symptoms do take place,—rigors, chilliness, and smallness of the pulse,—they usually last but for a short time. They soon yield to symptoms of excitement; and these symptoms continue throughout the disease; though perhaps, after a time, they are united with symptoms of great debility;—just as is frequently the case in inflammation.

The general symptoms of continued fever vary, from those which characterize an *active* inflammation, down to those which accompany an *atonic* or a *passive* inflammation, or even those which denote mortification; so that you have symptoms of activity and strength, and all the intermediate shades and degrees, down to symptoms of extreme prostration of strength; and even a disposition to putrescency in the fluids of the body.

In an attack of fever, there is, from the first, more affection of the head, than when the constitutional symptoms of mere inflammation occur. There is generally at first more or less confusion, giddiness, and drowsiness; perhaps even stupor, or watchfulness. There is generally, from the first, pain of the loins; with a complete loss of appetite, and a general sense of debility. The countenance, too, in fever, is almost always expressive of heaviness and anxiety. The countenance of continued fever, is exceedingly characteristic; the patient is both very heavy in his look, and is evidently, at the same time, labouring under a degree of uneasiness. Sometimes, in these circumstances, the face is pale; but still there is the heaviness and the anxiety. Sometimes the face is flushed, and the eyes look red; and there is frequently great heat of the head. The vessels feel to the patient to throb; and they feel so likewise to the medical attendant. There is then great pain usually felt in the forehead. The tongue is generally tremulous; whatever may be its appearance as to dryness or colour. The extreme feeling of weakness, and the aching of the loins, in the beginning of this disease, are no less characteristic than the countenance.

When those symptoms, which I have now mentioned, occur quickly and acutely, they show the existence of continued fever; more espe-

cially the morbid appearance of the tongue, the heat, the quick pulse, and the thirst, be out of all proportion to any signs of local inflammation that may exist. In these circumstances we consider that the patient has *fever*, in the proper sense of the word;—*idiopathic* fever;—fever as distinguished from mere pyrexia. Local inflammation frequently exists at the same time; but whether there is *always* local inflammation present or not, is a theoretical question upon which I will not now enter. These symptoms, however, very frequently occur without any *evidence* of local inflammation; and are as frequently out of proportion to any that we may observe; and it is this circumstance that makes us consider the person as labouring under *fever*, properly so called.

As to the particular symptoms to which I have just now alluded, the heat is sometimes intense. The temperature of the body will sometimes rise to 104°, 108°, or 110°; and sometimes it is of that peculiar character which authors have denominated *mordant;*—a pungent, or biting heat. Galen, Sir J. Pringle, and Sir G. Blane, all speak of "mordant heat." Galen, when treating of autumnal remittent fever, says, that the great mark of it is the mordacity and acrimony of the heat; which erodes the touch, just as smoke does the nose and eyes:—"Maximum indicium est mordacitas et acrimonia caloris; quæ, perinde ac fumus nares et oculos, sic ipsa erodere tactum videtur." This peculiarity of heat is not felt, he says, the moment the hand is applied; but is perceived on continuing the hand upon the patient for a certain time. Sir Gilbert says that, in ship-fever, there is a peculiar heat of the skin;—a glow of heat imposed upon the palm of the hand of the practitioner, who has grasped the wrist of the patient; and which lasts some hours, if the hand be not washed sooner. He adds that he never saw this in the sporadic fevers of England; though he has been informed of its occurrence. Andral also mentions the same circumstance. He says that, in the continued fever of Paris, the heat of the skin was in one case very high, acrid, and mordant;—leaving a sense of heat for some time upon the hand of the practitioner;—a sensation, he says, very nearly allied to pain:—"La chaleur de la peau étoit devenue très elevée, acre, et mordicante. En laissant quelque tems le doigt en contact avec elle, on eprouvoit une sorte de sensation penible, voisine de la douleur." Sometimes, however, the heat is not increased in fever; or if it be increased, it is only partially; and it varies in degree at different times. Occasionally, the temperature in fever is below what it ought to be; and in the last stage, you have sometimes absolute coldness.

The pulse, like the temperature, is generally increased. The pulse in continued fever may be full or hard, soft, small, or weak. Like the temperature, it may be of all degrees. As the temperature may be from 110°, down to far below the natural standard, so the pulse may be quick, full, hard, and strong; or it may be more or less slow. It may be so feeble, as to be easily extinguished;—to be what is called a fluttering, or a vermicular pulse. It varies in this way, according

to the tonic or atonic character of the disease; and according to the stage of the affection. In examining the pulse, if there be signs of debility, and the pulse be strong, we ought to examine the actual state of the circulation at the heart itself. We ought, if we be in any doubt, to resort to that method; for occasionally there may be the extreme debility of fever, with rather a strong pulse. The heart may be in a state of disease, which you may not be aware of; in consequence of not having seen the patient before his present illness. The heart may be greatly thickened; and although it may be acting less forcibly than it did before the attack of fever; yet it may act from its thickness so as to produce a full pulse; such a pulse as might incline you to adopt active measures.

I have brought with me a curious specimen of diseased spleen, and diseased heart; shewing intense ossification. Here is the spleen, with the peritoneal coat exceedingly thickened;—so thickened that it has become absolutely white. It is not only thickened, so as to have become almost cartilaginous; but there is a rare occurrence within. The blood-vessels, I presume the arteries, are ossified. On passing your fingers over any of these you will find that the coats of the vessels are bony. The tendency to ossification was so great in this case, that not only the vessels of the spleen, but likewise the coronary vessels of the heart, have fallen into a state of induration and ossification. The patient from whom this was taken, had no symptoms of angina pectoris; which are said to take place when the coronary arteries are ossified. There is another curious circumstance. Ulceration has taken place in the peritoneal coat of the spleen, which is rather a rare thing; though sometimes you will see ulceration beginning in a serous membrane, and going inwards. In general, ulceration proceeds outwards, (as is the case in ulceration of the intestines), till at last the peritoneal coat is ulcerated; but here the external coat of the spleen is alone ulcerated;—there being no ulceration beneath it.

The quickness of the pulse in fever may amount to about 200. Of course you cannot count such a pulse as this at the wrist; but you may count it, with perfect ease, at the heart itself. The usual range, however, of the pulse, in continued fever, is from 90 to 160. Occasionally it is not quick;—just as the heat occasionally is not increased; nay, it is sometimes even slower than it should be. This takes place chiefly when the head is very much oppressed. It occurs sporadically from the state of the head, or from some peculiarity in the individual's constitution. It has, however, occurred epidemically. Fevers have occurred epidemically, in which one of the characters was slowness of pulse. De Haen mentions a sporadical case of very severe fever, in which the pulse was only 44. Sarconi, in his account of an epidemic which prevailed at Naples, states that the pulse was hardly more than 40 in a minute, in some cases.

Occasionally in fever the pulse is regular; while in health it is intermittent. Many such instances are upon record. Andral mentions a case of fatal fever, where the pulse at first was intermittent;

but as the symptoms grew worse and worse, the pulse became more and more regular; till at last it was perfectly so. Rasori, the celebrated Italian physician, mentions the case of an individual, in whom the pulse was regular till the fever was over; and then it became intermittent. He therefore inferred that his pulse, in health, was naturally intermittent. De Haen also mentions the case of a man, who had an intermittent pulse at all times, except when he was labouring under fever. Monro and Shenkius mention such cases; and Dr. Heberden himself saw two persons, whose pulse was always intermittent, except during illness. I may mention that Dr. Heberden knew a female, who had intermittent pulse all her life; and who at last died of cancer of the womb; but in whose circulating system, an able anatomist could discover nothing unhealthy.

The skin in fever is usually dry; but as a favourable change takes place, it becomes more soft; and the moisture is for the most part general. Sometimes, however, in fever there are partial sweats, which are by no means favourable; and when death is near at hand, then the sweats are generally both cold and clammy. Sometimes the sweats are offensive; especially if there be great debility. Upon the skin are not unfrequently seen spots;—discolourations of various sizes. If they be exceedingly small, they are called *petechiæ;* if larger, they are termed *vibices;* if still larger, they are denominated *ecchymoses.* These spots are of various shades; from a tolerably bright redness, down to a purple hue. They occur particularly in the last stage of the disease, where there is extreme debility; but sometimes they occur where there is *not* great debility. At particular periods, continued fever is characterized by them; and I have seen a greater number of instances of this description, within the last three months, than I ever saw before in the whole of my life.

The tongue is usually dry in fever. With respect to colour, it may be white, or yellow, and loaded; it may be of a whitish brown, or really brown; or it may be absolutely black. Occasionally it is brown down the middle; and has a broad white band on each side; the edges, perhaps, being red. You will sometimes see it of a reddish brown. Occasionally it is red, glazed, smooth, and dry; and not unfrequently in these circumstances, it is cracked also. It is very common to see it more or less white or brown on the back; with redness at the tip, or redness at the edges. Occasionally it is extremely pale. When the tongue is of a reddish brown, or really brown, or absolutely black, you have usually likewise collections of black matter about the teeth and lips;—*sordes*, as they are called. They are the result, no doubt, of vitiated secretion; and sometimes they are partly the result of a little effusion of blood, which coagulates, and uniting with the secretion, contributes to their formation. The tongue, you will remember, is generally tremulous; and frequently the extremities are in a similar state;—so that, when the patient attempts to move, his hands or his legs tremble; but even when they do not, you may generally observe a tremor of the tongue. From the dryness of the tongue, and perhaps of the fauces,

the patient necessarily suffers thirst. The breath is frequently offensive;—much more so than the perspiration.

The urine is scanty and high-coloured; containing an excess of the lithates, and the purpurates;—chiefly the purpurate of ammonia, but also the purpurate of soda; together with the yellow colouring matter, which naturally exists in the urine. As the fever declines, the lithates become super-lithates, and are precipitated; so that you have a red sediment. The urine has a strong animal smell; and not unfrequently it has a strong ammoniacal smell; and almost as soon as it is discharged, it rushes into a state of putrefaction. Occasionally the urine is very dark coloured; and sometimes it is bloody.

With respect to the stomach, the appetite, for the most part, is lost; but just as there are extraordinary instances, from time to time, with regard to the pulse (such as its being regular in fever, while it is intermittent in health) so, with respect to the appetite, there are cases upon record in which, so far from its being lost in fever, it was much increased. You will find a case mentioned by Dr. Satterly, in the fifth volume of the "Transactions of the College of Physicians," of a boy who laboured under typhus fever, attended by marked inflammation of the head. The exacerbations of the fever were always attended by a voracious appetite; so that, in the midst of the fever, he would eat four meals a-day, and each meal would have been sufficient for a stout labourer. Besides these four meals of meat and vegetables, he daily ate many pounds of dry bread, biscuit, and fruit. He had no sooner eaten a meal, than he denied that he had eaten any thing; so the more he ate the more he desired:—

"Cibus omnis, in illo,
Causa cibi est; semperque locus fit inanis edendo."

If he was not fed the moment he requested it, he sucked the bedclothes and bit his fingers; in this also bringing to one's mind Ovid's account of Erisichthon:—

"Ipse suos artus lacero divellere morsu
Cœpit, et infelix minuendo corpus alebat."

This boy discharged several very copious stools a-day; and he recovered perfectly. The appetite, however, usually returns as the disease declines; and when the disease is first gone, the appetite is for the most part voracious. Persons say there is nothing the matter with them; but that they are hungry. The stomach, however, is frequently much more affected than with mere loss of appetite. Even from the very first there is nausea; and, in many cases vomiting. Sometimes the vomiting does not occur from the beginning;—does not make its appearance, till the disease has existed for a length of time. The stuff which is vomited may be mere mucus; or it may be bile; or it may be like coffee-grounds; and sometimes the quantity is very considerable.

The intestines likewise suffer in this disease. There is often more

or less costiveness; but very often there is diarrhœa. Sometimes the diarrhœa begins with the disease; and sometimes it will not come on, till the latter has existed for a certain period. The character of the stools is as various, as the character of the matters vomited. They may be very watery; or they may be mucous, or (as the common people say) slimy. They may be, in colour, yellow, greenish, or white. They may be exceedingly offensive; and perhaps bloody.

The functions of the brain are almost always affected. Pain, vertigo, and tinnitus aurium, are very common; and sometimes there are convulsions, dullness, or stupor; there is usually great depression of spirits; and there may be delirium at night, terrific dreams, and watchfulness. It is said, with regard to respiration, that more oxygen is consumed in the hot stage of fever (as well as during digestion and exercise) than in health; and that more carbonic acid is formed; whereas, in the cold stage (as indeed after bleeding, and in dyspœa) less oxygen is consumed, and less carbonic acid formed.

Now the disease, such as I have described it, may have all the symptoms of mere excitement, with no remarkable debility. There is always a feeling of more or less debility; but there may be sometimes *chiefly* excitement; and only that debility which is inseparable from fever. The fever may be subdued; the morbid changes, which I have mentioned to occur in the secretions and functions, may decline; and nothing but weakness and a degree of emaciation may remain; and recovery from these may speedily take place. The emaciation, I may observe, is proportionately greater after fever, than after any other acute disease. However, this may not be the progress of the case. Signs of debility may appear; the breath may become very fœtid; as may also the perspiration, and all the discharges;—whether from the stomach, the intestines, or the urinary bladder. What is vomited may be like coffee-grounds; the urine may be bloody; and so may the fæces. Even blood may be found in the mouth; or may be poured forth under the skin. There may be extreme blackness of the tongue; and a great quantity of sordes upon the teeth, lips, and every part of the mouth. All the fluids may be secreted in so vitiated a manner, that they may putrefy as soon as they are discharged; and the body may become putrid directly after death. One cannot conceive the possibility of putrefaction of parts still alive; or of the secretions at the moment of their formation; but they are often as near putridity as is compatible with life. The secretions putrefy, the moment they are separated from the body; and the body itself, as soon as it is dead, will frequently rush into great putridity. The discharges are sometimes so offensive, that perhaps the very house is intolerable. In these circumstances, the pulse is very rapid and very weak; there is extreme prostration of strength; and a death-like faintness is complained of by the patient. The face becomes ghastly;—in fact, you have the *facies hippocratica*. The intellect is greatly disturbed; there is an

inability to attend to any thing; a troublesome hiccup; catching and working of the fingers (called *subsultus tendinum*); perhaps convulsions; at any rate, cold clammy sweats; and an involuntary discharge of the urine and fæces. Still, the debility, and putrescency may decline; and a high degree of these symptoms be recovered from.

If the symptoms be purely inflammatory,—purely those of excitement, with good strength at first, and do not afterwards degenerate into debility, or at least not into *considerable* debility, the disease is called *synocha*. If they degenerate into great debility, it is called *synochus*. If, from the very first, great symptoms of debility appear, it has been called *typhus*. These are arbitrary names;—the two first having the same etymology; but they do very well to express different characters of the same disease, in different individuals. When it is called *typhus*, it is the same fever as many authors write of under the name *ship*-fever, *hospital*-fever, *gaol*-fever, *putrid*-fever, or *adynamic* fever. If the symptoms be very severe indeed, then it is called "typhus gravior;" but if they be mild, though it even prove fatal, it is then called "typhus mitior;"—typhus being divided into two varieties. There is every variety in continued fever; both as to the degree of excitement and the degree of strength;—from the very highest excitement, and a high degree of strength, down to the most absolute prostration that can be present; and from no putrescency, up to a high degree of it.

The parts most dangerously disturbed in fever, are the head, the chest, and the abdomen. The relative proportion of disturbance, in these different regions, is exceedingly various; but the head and abdomen suffer most of the three; except where there is a particular epidemic character; or an individual predisposition to, or a local cause of, excitement in the chest. With these exceptions, the head and the abdomen suffer far more, in continued fever, than the thorax. It is in hot climates, and in hot seasons, that the abdomen is most affected. The local disturbance, when very great, is usually of an inflammatory kind;—at least it is usually inflammatory at first. But as there are all degrees of the general affection, from tonic to atonic, so the local affections may be of all degrees of violence; varying from active tonic inflammation, down to mere irritation, or extreme loss of power.

To begin with the *head*. The local affection there, when very great, may give rise (as I have said before) to drowsiness, headache, convulsions, vertigo, watchfulness, and tinnitus aurium. But it may amount to a higher degree than this; so that you have violent headache,—such as distracts the patient; violent throbbing, which is visible when you look at the temples; intolerance of light; redness of the eyes; and violent delirium. The delirium may be constant; and it may be such as to require corporeal restraint. There may be loud, incessant, incorent ravings; and ignorance of persons and things, which before were perfectly familiar to the individual; and yet, in the midst of this, a person may be rational and sensible for

a single moment;—he may be momentarily recalled by some circumstance, but is instantly off again. At the same time, there is a picking of the bed-clothes, and tremor. Delirium of this description, is called *delirium ferox*. On the other hand, the delirium is sometimes not of this ferocious character. The patient mutters to himself; there are altogether slighter symptoms of disturbance of the head; and it is then called *delirium mite*. Occasionally, where there is great debility, there are no symptoms of vascular excitement in the head;—no headache, no intolerance of light, no redness of the eyes, or throbbing of the temples; but merely muttering delirium. Sometimes there is great stupor, and a comatose state; with or without symptoms of an inflammatory disposition in the head.

As to the *stomach*, there is almost always anorexia, vomiting, purging, or costiveness; but these symptoms are sometimes extreme. There may be copious and intense vomiting of every thing that is taken, and of fluids of all descriptions. There may be violent diarhœa,—of all kinds of characters. The abdomen may be excessively tender to the touch, and painful on the slightest pressure. It may be exceedingly distended; and may be especially painful at the epigastrium, or in the hepatic region. There may be a sense of burning in the abdomen, more particularly at the epigastrium; it may be felt likewise up the throat, and be attended by extreme thirst. When the symptoms in the abdomen run high, they are extreme vomiting, extreme purging, extreme tenderness, and perhaps violent pain, even when compression is not employed.

The state of the *tongue* has been supposed to correspond with that of the alimentary canal. When the internal coat of the stomach is inflamed, the tongue is certainly often, perhaps generally, red; either throughout, at the edges, or at the tip; but the agreement in the two organs is not constant. The tongue may be red in fever, and in other diseases, without any corresponding state of the stomach;—at least, without any *evidence* of it; and therefore the alleged universal correspondence is a mere assumption. A blackness of the tongue is rather indicative of the general debility of fever, than of a gastric affection. Thirst may be commensurate with a gastric affection; but it may arise simply from the intensity of fever drying the fauces. Again, ulceration and inflammation of the stomach or intestines have been found, where the tongue had not been red during life; and it is said that sometimes neither they, nor any abdominal inflammation, could be discovered, where there had been much pain of the abdomen experienced on pressure. Purging may be very violent without inflammation of the mucous membrane; which may be found healthy in consistence, and even pale; just as we have profuse sweating in various circumstances, without any inflammation of the skin. It is not a necessary circumstance that the tongue should indicate the state of the stomach or the intestines. There is a certain correspondence between them; but it is by no means invariable. Neither is it a necessary consequence that, when we see great irritation of the stomach, and great irritation of the intestines, there should be in-

flammation. Frequently, after such circumstances have occurred, inspections have not shown that inflammation existed.

As to the *chest*, it is commonly a little affected. In general, we have the breathing more or less quickened; and there is a little cough; and generally, if you employ the ear, or the stethoscope, you will find in fever some degree of sonorous, or sibilous, or mucous rattle in the lungs. The symptoms may not be such as to attract the attention of the patient, or the practitioner, or to demand any measures; but if you listen with the stethoscope, I believe you will generally find the mucous membrane of the bronchia more or less affected, in this disease. Sometimes, however, the respiration is very *much* affected. It becomes very rapid; and there is violent cough; pain in the side, or at the front of the chest; great rattle; copious expectoration; and all the decided signs of bronchitic, pleuritic, or peripneumonic affection; so that, at last, there is blueness of the lips and cheek, from congestion of the lungs. I believe that all along, there is more *congestion* in the lungs than actual *inflammation*. The affection of the chest, though it generally exists, is far less frequently of an inflammatory nature, than the affection either of the head, or the abdomen; and, of these two, the abdomen suffers most.

If we examine the *blood*, we may find it buffed, and perhaps cupped; but frequently it is quite natural. Sometimes the coagulum is exceedingly loose,—corresponding with the debility; and frequently it soon putrefies. In the typhoid stage of exhaustion and debility, it has been found lately that the chemical characters of the blood are very depraved;—that it abounds more and more in serum, and less in its other constituents. As the disease is more and more characterized by debility, the blood at last resembles mere fibrin and serum. Little or no chyle is formed; and the blood is deficient in carbonic acid, and in saline materials. Dr. Clanny, of Sunderland, pointed out this circumstance; and Dr. Stevens made similar observations. He made them in a distant country, without knowing what Dr. Clanny had done; so that we have the unbiassed observations of two physicians, unknown to each other.

Besides those particular parts that I have now mentioned, others are sometimes very much affected. Sometimes the eyes will become inflamed; and sometimes the throat, bladder, or skin. Sometimes we have an eruption of minute vesicles, of the size of millet seeds; sometimes we have large patches of inflammation; sometimes we have irregular pimples,—papulæ. Occasionally we have a great discharge of blood from the intestines, and urinary passages; and perhaps all this without any correspondent severity of the general symptoms. Sometimes we have inflammation of the parotid glands, ending in abscess. Occasionally abscesses will form in different parts; and sometimes a great crop of boils will appear. Now and then mortification of some part occurs; not general mortification within the head, chest, or abdomen, (the parts which are affected with *inflammation* in these cases); but mortification of the extremities, or of the loins. The debility is such, in this disease, that

from a patient lying long on his back, the loins are much disposed to mortify; and so may one or both hips. There being universal debility, the effect of pressure is not resisted, as it is when we are in health. If we lie upon a part, for any length of time, in health, it will not produce mortification; whereas persons in the debility occasioned by fever, from lying on their back, will soon have the circulation sufficiently impeded by the pressure, to cause mortification. After fever, the mind will sometimes remain dull, or even imbecile, for a length of time;—sometimes for several months; and sometimes there is a great depression of spirits, which the patient, although in other respects pretty well, cannot shake off. Sometimes after fever, a hand or a foot, or both hands and both feet, or a whole extremity, will remain for a longer or shorter time bent, and little influenced by volition; so that, indeed, a person is perhaps a cripple for life. I have seen several persons, whose hands or feet have been bent up in this way, after fever; and where this state ceased after a time; but I have seen others, in whom this state of parts had continued many years after fever, and continues still.

The duration of the disease, whether active and inflammatory, or of great debility and even putrescency, may exist from one or a few days, to several weeks; but it rarely extends beyond eight or ten weeks. Occasionally the disease will end with a discharge of blood, either from the nose, the intestines, or other parts; or with purging or sweating. Dr. Gregory said that he once knew a fever terminate by a great discharge of healthy urine. Andral says that he once saw a fever terminate with a profuse expectoration; and once with an alternation of sweating and expectoration. Suppuration after the disease, a general crop of petechiæ, and even the emaciation which follows the disease, you will find mentioned in authors as happy terminations; as critical circumstances, which were closely connected with the happy result of the affection.

These discharges, when they occur, are called *critical;* and the mendment is called a *crisis.* The ancients imagined that a crisis occurred particularly on certain days; and hence those days were called critical. During the first eleven days of fever, these critical days were of a *tertian* character; so that the third, fifth, seventh, ninth, and eleventh days, were critical days; and were supposed to be those, on which the disease was disposed to terminate well. After the eleventh day, the type was supposed to be *quartan;* so that the fourteenth, the seventeenth, and twentieth days, were then supposed to be critical. If a change took place, it was supposed to be most favourable and most complete when it occurred on those days. It might happen on other days; but it was then supposed to be less favourable. Some are of opinion that the testimony of Hippocrates and Galen, among the ancients, and of Dr. Fordyce,* Dr. Stoker, and Dr. Percival,† among the moderns, in favour of these critical days, is too great to be withstood; but others imagine that it was a

* See his "Dissertations on Fever."

† "Practical Observations on Typhus Fever; by Edward Percival, M.B."

mere hypothesis, founded upon the Pythagorean doctrine of numbers; or that it was taken from the types of *intermittent* fever, which the ancients supposed *continued* fever must very much resemble. De Haen says, that of one hundred and sixty-three terminations of fever mentioned by Hippocrates, one hundred and seven (that is, two-thirds) took place on the critical days;—namely, on the third, fifth, seventh, ninth, eleventh, fourteenth, seventeenth, and twentieth; that none took place on the second or thirtieth; and only eighteen (that is, one-ninth) on the other non-critical days; namely, the eighth, tenth, twelfth, fifteenth, sixteenth, eighteenth, and nineteenth. Certainly the only types of fever now talked of here, are those of fourteen and twenty-one days; so that the common people will say, that a patient has a fourteen, or a twenty-one day fever. Perhaps the vulgar only retain notions which formerly prevailed among physicians. Physicians may have inherited these notions from the ancients; and so they may have come down to us, and still linger among the vulgar. The notion *may* be correct. Some persons say they do observe these things; but I cannot say that I have ever noticed the disease to terminate on one day, in preference to another. The reason that we do not observe what the ancients did, is said to be, that we are more active in practice than they were. We do not let nature take her course, but endeavour to knock a morbid process on the head; and we cure for more cases of fever than they did. We allow diseases to run on a much shorter period, than they were accustomed to do; and some ascribe the want of critical days to our active practice. To shew the inefficacy of the practice of the ancients, Broussais mentions that Hippocrates, in the first and third sections of his work an Epidemics, gives an account of thirty cases of acute disease; in which cases sixteen of the patients died, and the other fourteen suffered much afterwards. It must have been bad practice to lose sixteen acute cases out of thirty, unless in particular circumstances;—such as in the eastern epidemic, improperly called *cholera morbus*. Sir Gilbert Blane says, that, in the first and third sections of Hippocrates, forty-two cases of acute disease are mentioned; thirty-seven of which were continued fever, *without* local affection; and five *with* local affection. Of these twenty-five died;—twenty-one out of the thirty-seven, and four out of the five. If nature had an inclination to perform her cures on certain days, she had there a fine opportunity; but at the present day we so interrupt her course, that I have never observed critical days.

You may suppose, from what I have said, that the appearances after death will vary exceedingly. You will be prepared to expect that they are chiefly situated in the head, chest, and abdomen;—occasionally in *one* of these parts, occasionally in *two*, and occasionally in *all*; and you will be prepared to expect that, in all these parts, they will sometimes vary, both in their positive degree, and their relative proportion. You will also expect the appearances to vary, from those of active inflammation, down to very slight marks

of inflammation indeed;—where the case has been one rather of irritation than of inflammation; and you will expect them sometimes to be those, not merely of ulceration, but of gangrene, or an extreme degree of softening. The morbid appearances are chiefly found in the head and abdomen; just as the local symptoms during life are principally situated there; and occasionally we find degeneration of the structure of parts, without much inflammation; exactly as I said was often the case independently of fever. We have softening, and various other changes, without any marks of inflammation at all proportionate to those changes.

We will begin with the *head*. We shall sometimes find in the brain, more red points than usual. We shall sometimes find the arachnoid injected; both as to its superficial portion, and as to that portion which lines the ventricles. The veins and sinuses are frequently found turgid; and frequently there is too much serous fluid upon the brain, and in its cavities. But you must remember that, in all this, there is great room for fanciful opinion. On opening the brain, some will maintain that it is very healthy; and others will contend that there are more bloody points than there ought to be;—that the veins and sinuses are too full; or that there is more serous fluid than natural. You must take care, therefore, to be quite sure that you are right, when you assert that any thing preternatural is found in the cavity of the head. It will continually happen in fever, that there shall be rather more bloody points than usual; without the patient, during life, have shown particular symptoms of an affection of the head. These appearances will vary in different individuals, even in health; exactly as appearances do in other parts of the body. To enable us to say that there are decided inflammatory marks about the head, we ought to see appearances respecting which no one would entertain a doubt. When two or three persons differ in opinion, we ought to be much upon our guard in supposing, that there is really any morbid appearance. I know there is so much fancy in all these things, that it is absolutely necessary to exercise the greatest caution in drawing a conclusion. But sometimes you do find, in fever, more bloody points than natural in the substance of the brain. You sometimes see the vessels of the pia mater really in a state of congestion; sometimes the sinuses; and sometimes you find more fluid, indisputably, than ought to be there. This fluid is various in its appearance, as in all other cases of affection of the head. Sometimes it is clear; sometimes turbid; sometimes fragments of lymph may be seen floating in it; now and then there is even effusion of blood, or (at any rate) the serum is bloody. But very often in fever, after there has been strong phrenitis, or strong marks of excitement of the head, you will find nothing. I have repeatedly opened patients, who have died with marks of affection of the head, in whom the appearances after death have been quite disproportionate to the symptoms which occurred during life; and others in which I doubt whether any one, unprepared to *expect* any thing in

the head, would have *found* anything. Indeed, it is said by Andral, that the morbid appearances in the head, are less than those in the abdomen; and I believe this to be the case.

If the *chest* happen to be the part very much affected, (which is rarely the case), then you may have far more morbid appearances in the chest than in the head; notwithstanding many have said that the disease is situated in the head. If the thorax happen to shew marks of disease, you may find the lungs soft;—you may find them filled with a frothy red fluid; and sometimes they will crepitate as in health, and sometimes not. Sometimes they will be soft, and quite impervious to the air, especially if there have been extreme debility; and sometimes, but very rarely, they are in a state of gangrene. It is very rare to find them in a state of solidification, or what is strangely called *hepatization*. Because the lungs are as solid as liver, this morbid state is named after that organ; but it is most improper, because no part can be converted into liver. It may have the common qualities of liver, as to colour and consistence; but as to calling it hepatization, this is decidedly incorrect. This red *solidification* of the lungs, however, is rare. Now and then you will find them solid and grey in different parts;—spots of grey solidification; and it is common to find an abundance of red frothy fluid in them. One of the most frequent appearances in the chest, is redness and thickening of the bronchial tubes; because a slight degree of bronchitis is very common in fever. In almost every case, if you listen, it is said you may find more or less sonorous rattle; shewing a little bronchitis. Now and then the pleura is affected. An effusion is observed in the pleura; perhaps redness of the membrane; perhaps adhesions;—at any rate an effusion of lymph. Now and then even blood is found. The appearances, in fact, bear an analogy to those which are found in the head. The blood which is found in the heart and large vessels, is generally fluid, and of a very dark colour. As to the coats of the arteries being inflamed, that you will not necessarily find to be the case; though some have said that in fever they are always inflamed. The inner coats of the arteries may be inflamed now and then, like other parts; but you may open scores of bodies, and find no such thing.

If we come to the *abdomen*, we shall sometimes find marks of inflammation of the peritoneum, or at least of the sub-peritoneal cellular membrane;—if not of the peritoneum itself, of the cellular membrane immediately under it; or we may find inflammation within the stomach and intestines. The intestines are in general contracted, whether inflamed or not; but inflammation in the intestines is very common, as well as in the stomach; and is situated in the cellular membrane under the muscular coat, or in the mucous membrane itself. It has been long known that, in fever, the intestines are very frequently inflamed. Theophilus Bonetus, an old writer, says that inspections of those who died of intermittent fever, shewed that the stomach and intestines were inflamed. "Anatome

eorum qui febre malignâ extincti sunt, docet ventriculum cum intestinis inflammari."* Bartholini bore testimony to the same fact. "In omni febri acuta, imminet ventriculi inflammatio." Sydenham says that the intestines are frequently ulcerated in continued fever.† The knowledge of inflammation existing in the intestines, and also other affections, is not altogether new; though the fact was neglected. When you come to open the intestines, you will frequently find very extensive redness; and the redness will sometimes end suddenly, as inflammation of the skin will do; and sometimes it is lost insensibly in the surrounding parts. Occasionally you will find the redness extensive, running the length of a foot or so; but generally it is found merely in patches. Occasionally this redness is arborescent; and has little red spots around it. The redness varies in hue, from a bright red to a brown, or even a purple shade, according to the degree of congestion; and sometimes it is a very dark red. In continued fever, the mucous coat is often thickened; and it may be thickened to a great extent, or only in patches. Sometimes it is softened; and, indeed, all the coats of the intestines, are sometimes in the same condition,—softened. On the inner surface of the intestines,—the mucous membrane,—there are frequently small, red, conical elevations,—pimples; like the fringes below the tongue; or little white projections, either conical, or with a central depression. These last appearances are observed much more in the inferior two-fifths of the small intestines, than elsewhere; indeed, it is in this situation that we find the chief morbid appearances. In the colon they are generally pointed. Occasionally these white conical elevations, are real pustules;—or at least small follicles, containing real pus; so that you have what may be considered pustules.

The secretion of the intestines is, of course, diseased. You find the mucus of a thicker quality than it should be;—sometimes almost as thick as fibrin; and sometimes it is bloody. The mucous membrane will frequently peel off; not from any affection of its own, but from the cellular membrane which attaches it to the next coat being so brittle, as no longer to form a medium of union. Very frequently a quantity of blood is effused into the cellular membrane, under the mucous coat. Nothing is more common than to find ecchymosis;—an effusion of blood into the cellular membrane, under the mucous coat. Ulcerations are continually found in the lowest third of the ileum, nearest to the cœcum; and the nearer you come to the cœcum, the greater is the degree of ulceration. These ulcers are frequently seen in the midst of red patches. I just now mentioned the frequent occurrence of red patches; and in the midst of these there is frequently ulceration; and then, again, the surface beyond the patches is frequently pale. It would seem that superficial inflammation had taken place locally, with great severity; and in the centre had proceeded to ulceration. But you will find these ulcers

* Bonetus (T.) "Sepulcretum, sive Anatomia Practica;" 3 tom. folio.

† See his "Opera Medica;" or the same work translated, by Dr. G. Wallis; 2 vols. 8vo.

frequently occur, also, in the little pimples or pustules of the glands; so that you have in the intestines two kinds of ulceration;—the one superficial, giving you the idea of an abrasion, (such as occurs in the mouth, throat, or on the organs of generation);—and the other occurring in the glands. These ulcerations are of all sizes, and of all shapes. You sometimes see a portion ulcerated to a very great extent; and sometimes these ulcerations are sloughy; or at least you may detach a sloughy layer of something;—perhaps sometimes a diseased secretion; and underneath you find an ulcer. Surrounding the glandular ulceration, you will frequently see the mucous membrane more or less detached; and the ulcer of course extends to various depths. Sometimes it extends so deeply, as to go through all the coats, and perforate the peritoneum. When this occurs, there is generally sudden peritonitis induced. Pain is felt at a particular spot, and darts from it in all directions; and speedy death generally ensues. Nature, however, sometimes prevents this (as I formerly said) by producing adhesion; or perhaps the perforation is blocked up by a piece of omentum, or something else; but if this do not occur, violent peritonitis takes place, though not always. Occasionally the inflammation which is produced, is of a slow, chronic form. The patient recovers from the fever; but continues to labour under peritonitis, in a chronic form. Occasionally there is no pain; but this is rare. Generally, when a perforation occurs in the peritoneum, violent peritonitis is induced; and the patient sinks. Now and then, you will have an abscess in the *substance* of the intestines;—in their cellular membrane, I presume. It occurs as it does in the cellular membrane any where else. The peritoneal and the mucous coats being sound, the matter is produced between them; and is contained in the cellular coat. With respect to inflammation of the *muscular* coat of the intestines, I do not believe that such a thing occurs. Mucous, cellular, and serous membranes, are far more frequently inflamed than muscles. It is rare for muscles to be inflamed; and there is sufficient of the former structures in the intestines to become inflamed, without supposing that the muscular coat is the seat of inflammation.

The period at which these ulcerations may take place, is very various. It would appear that, occasionally, they will take place rapidly; because persons have shewn them who have only had fever a couple of days; but generally they occur slowly. They are more frequently observed in persons who die of fever, than in those who fall victims to other complaints. The large intestines are seldom affected;—at least, far less so than the stomach or the small intestines; and of the latter, it is in that portion nearest the cœcum,—the lowest third of the ileum, or at the utmost the lowest two-fifths,—that you chiefly find these appearances.*

* The learned Professor here exhibited several plates, executed by Dr. Carswell, illustrative of the various morbid appearances he had described, as occurring in the intestines. He subsequently introduced a very fine specimen of ulceration of the intestines after fever; with which he had been furnished by Dr. Tweedie, physician to the Fever Hospital.

Now some have patronized the head, and determined that it shall be the seat of fever; and that fever situated there shall be inflammatory; whereas others have had a predilection for the abdomen, and have declared that fever is seated there, and that it is imflammation of the intestines.* It is true you may find morbid appearances there; but it is also true that you may open cases of fever, and find the intestines sound; or, at least, with no such appearances as will explain the symptoms of fever. I have, over and over again, inspected cases, in which there was no ulceration of the intestines,—no inflammation even; and in which, if persons had not been told it was a case of fever, they would not have known it. There might sometimes have been a little more redness than usual, in this or that intestine; or if even there was any thing morbid, still it was insufficient to account for the general symptoms of fever. The symptoms observed during life, frequently depend upon local affection; but frequently you will find no disease existing in any particular part. Andral, I think, is one of the soundest writers on Medicine. He appears to have no theories; but to look out for facts, and to make the most correct and philosophical use of them. I have found all he has said, in his Clinical Reports, to be confirmed; and though it was not till lately that I read his book, yet I was delighted to find the coincidence in our facts and inferences. He says, that of thirty-eight cases of fever which he examined, only eleven presented marks of gastritis sufficient to have influenced the symptoms during life. Thirty out of the thirty-eight shewed some sort of intestinal affection; but only fourteen of these (that is, fourteen out of thirty-eight) exhibited such a morbid affection of the intestines, as could explain any of the symptoms during life. He also says, that the changes which are seen in the nervous system, are comparatively rare and slight. I do not think that fever is to be explained by Morbid Anatomy. Many of its symptoms, and many of the occurrences which take place, may be thus explained. When there is phrenitis, you will usually have the *marks* of phrenitis; when there is bronchitis, you will usually have *marks* of bronchitis; when there is diarrhœa, you will expect to find ulceration of the intestines;—but frequently there is little or none of these symptoms; and after death there are no such marks as will explain fever; although there may be enough to explain the local symptoms that have occurred. Continually you will find, in fever, that the head is but slightly affected after the first few days; and that the abdomen is scarcely affected at all.

I believe that, in fever attended with extreme exhaustion, the muscles are generally soft and livid. The blood, I mentioned, is generally fluid and black in the large vessels; and the muscles are generally soft and livid;—a fact altogether corresponding with the

* Dr. Clutterbuck and M. Broussais may be considered as the heads, respectively, of these two pathological schools. See "An Inquiry into the Nature and Seat of Fever; by Henry Clutterbuck, M.D.;" and "History of Chronic Phlegmasia, or Inflammation. By F. J. V. Broussais, M. D. Translated from the French." 2 vols. 8vo. Philadelphia, 1830.

state of the blood. I mentioned that if, in a case of typhus fever, where there is great prostration of strength, you analyze the blood, you will find that it contains less saline matter than there should be; and it is said to contain less carbonic acid than natural; in fact, it is more like lymph than blood. The liver and spleen are rarely affected. The bile is often abundant, and sometimes very dark and thick; but in other cases it is just the reverse;—pale and thin. Sometimes it is acrid, and sometimes not. The liver or spleen may exhibit marks of inflammation; or, if not inflamed at the time, you may see the *results* of inflammation, in a little suppuration, &c. They may be softened. But all these things are very uncertain. So far, then, with regard to the symptoms of fever during life; and the morbid appearances after death.

As to the mode in which we form our diagnosis, and determine that the case is one of fever, it is, in a great measure, by observing that the constitutional symptoms are disproportionate to any local affection which may exist. The constitutional symptoms are, of course, influenced by a local affection; but they are out of all proportion to it; and frequently they are altogether of a different nature. For example,—there is often no local sign of inflammation, or of any local disorganization, to be discovered; but there is extreme debility from the very first;—a sense of debility, indeed, which is not observed in any mere inflammation. The countenance, too, is peculiar;—expressive of both anxiety and oppression. There is almost always, from the first, pain of the loins; and, nearly throughout the disease, tremor of the tongue. All these circumstances are very different from those which we see, in mere inflammation of the brain, or of the chest. You sometimes may have a local inflammation of the liver, or of the stomach; but you have also a disproportionate loss of strength; perhaps a feeble pulse; perhaps a putrescent state of the body;—symptoms, in fact, of a character different to those which arise from mere local inflammation. The countenance, and the sense of debility, are very characteristic from the very first.

As to the prognosis, of course it must be taken, in the first place, from the severity of the disease; but you need not give an unfavourable prognosis, because the constitutional symptoms of excitement are very violent. Here *general* excitement is by no means dangerous; but when it is accompanied by extreme *local* excitement;—by marks of severe local inflammation, then there is reason to apprehend danger. As long as you can discover no great marks of inflammation in the head, chest, or abdomen, the general excitement, however violent, is not in itself dangerous. But although you have no right to infer danger from extreme excitement, when there is no great local affection, yet symptoms of an opposite description are always dangerous. In proportion to the intensity of the signs of debility, is the degree of danger. Intensity of general excitement, is not alarming in proportion to the excitement; but the danger is proportionate to the marks of real debility.

The marks of debility in fever, are great rapidity and weakness of

pulse. Andral says that he never knew a person recover from fever, whose pulse exceeded 140; but I believe it is well known that recovery will take place after a pulse even of 160, however dangerous such a pulse may be. Dr. Heberdeen mentions recovery from fever, after a pulse of 180. If rapidity of pulse be accompanied by weakness, then of course the danger is so much the greater. Involuntary discharges of the urine and fæces, likewise shew great danger; because they prove extreme debility; or extreme local affection,—of the head or abdomen, for instance. They will arise from the patient being unconscious of what he is about,—from being in a state of stupor; and they will also arise from the patient being too feeble to make an effort to restrain them; either of which conditions is extremely dangerous. You will learn much, too, from the position of the patient. When a patient lies on his back, there is more danger than when he lies on his side;—a greater effort being required to maintain the latter posture; but if the patient sink in his bed, the danger is greater still; for it then shews that he has very little power at all. A person can exert the muscles of deglutition, long after he has lost control over those of the trunk; and an inability to swallow, therefore, is one of the most dangerous symptoms. The countenance, I have already intimated, is a good index to the degree of danger. Blackness of the tongue, and of the teeth, is also more or less dangerous. We see patients recover every day, whose teeth have been covered with sordes, and whose tongue has been black; but still it is a bad sign. Abundance of the discharges, too, is generally dangerous, unless the symptoms remit; and the danger increases in proportion to their depraved nature. Another very unfavourable symptom is the discharge of blood, or its effusion under the skin,—forming petechiæ, vibices, and ecchymoses. Of course, the larger these spots the greater the danger;—vibices being more dangerous than petechiæ; and ecchymoses more dangerous than vibices. Still, however, the presence of petechiæ in itself is not dangerous; for some epidemics are characterized by it; but if it be very considerable, and accompanied by other marks of exhaustion, then it is dangerous. Hiccup, too, is a dangerous symptom; on account of its usually coming on towards the fatal termination of the disease; but, now and then, fever may attack dyspeptic persons; and you may have hiccup, not so much from fever as from the disposition to it, occasioned by the habitually weak stomach. Early debility is a very unfavourable sign. Debility, after the disease has existed for a fortnight or three weeks, would not be so dangerous as the same degree of debility at the beginning of the disease; because, if the affection be to last for a fortnight, and you have at the beginning the same debility which, in other cases, you have at the end of a fortnight, the debility may be such when the latter period arrives, that life may be extinguished. The more intense the debility, in the early stage of the disease, the greater is the degree of danger to be apprehended.

When a person has violent pleuritis, peripneumonia, enteritis,

peritonitis, or any other local inflammation, of course the danger is aggravated; and the danger frequently rests solely upon this local affection. The age and constitution of the patient, are important considerations. Individuals of bad constitutions, who have been badly fed, or addicted to the vice of drinking, or have suffered from the want of proper rest, are of course very liable to fall victims to the disease. We must always consider the character of the epidemic; for if we know it to be of a dangerous nature, we should always give an unfavourable prognosis even at the outset, before dangerous symptoms have come on. We are sometimes obliged to give an unfavourable prognosis, from the state of the patient's mind. I have often seen patients die of fever solely because their mind was uneasy. I have seen two or three patients, within the last six months, who in all probability would have recovered from fever, had it not been for an unfortunate state of mind. If a patient has made up his mind that he shall die, or some real calamity presses upon him, then the medical man has a far less chance of success, than if his mind be in a state of happiness and tranquillity. If you know this to be the state of the patient's mind, you should speak with more caution than you otherwise would, even though things are going on favourably; for you have an additional enemy to contend with. You must also in giving a prognosis, have reference to the power which you possess of doing your duty. Sometimes, through the whims of friends, or the unwillingness of the patient, you are not allowed to do what you desire; and sometimes you are prevented, by another practitioner, from being quite as active as you wish in the use of means. These things are all to be taken into the account.

As to the grounds of a favourable prognosis, I need not say that they are the decline of all the symptoms. But you must be on your guard, when the symptoms are declining generally; and ascertain whether all is well throughout the body;—whether there may not be some local circumstance still existing, from which danger may be apprehended. For example,—fever will sometimes decline when the loins slough; and the patient may then die of exhaustion. A return of strength is one of the best signs. When a patient no longer sinks in bed, but is able to lie on his side, then the prognosis is favourable. You may judge much from the countenance, and from the feelings of the patient himself. It has been thought that deafness is a favourable sign;—at any rate, it is *not* an *un*favourable sign. Many authors have thought it favourable; but why it should be so, I do not know. In many cases of fever, patients become very deaf; and they recover, just as though this circumstance had not occurred. The return of all the feelings of the patient to a state of health, must contribute to a favourable prognosis. Dr. Gregory used to mention, as an instance of this, an amusing circumstance showing, not that the *stomach* had returned to its duty, but that *other parts* of the system were improved. On the doctor visiting one of his hospital-patients, labouring under fever, the man told him that he was much better; and added (as a proof of it) that he longed to have his mistress; on

which some wag put down in the prescription-book,—"Let him have his mistress." Dr. Gregory was too good-natured to be offended at any little joke of that sort; and used to mention it, year after year, with the greatest glee.

I will not enter upon the *exciting* causes of fever now; but will speedily run over the *predisposing* causes; and the first I shall mention is mental depression. Many persons do not become the subjects of fever (though exposed to all the exciting causes) till their mind is depressed. I have known many persons go, year after year, to spots where fever prevailed, from some local circumstance, with perfect impunity; till some calamity happened which greatly depressed their minds; and then they became the subjects of fever. It has been observed, with regard to the plague, that persons have not fallen victims to the disease, till they have lost a relative, or been cast down in spirits; and then they have sickened immediately. Diembroek mentions an instance of this kind. A person escaped the plague, till he saw a funeral pass by; and, on inquiring whose it was, he found it was that of one of his dearest friends. He went home, sickened of the plague, and died. The same circumstance occurs with regard to fever, and all other complaints. Anxiety of mind will have the same effect;—downright grief, or anxiety lest misfortune should occur. Corporeal depression, and over exertion of mind, will have the same injurious tendency. Too much muscular exertion, excess of venery, and debilitating circumstances of all descriptions, whether of mind or body, will lay the foundation for fever. The *want* of food, and *bad* food, are both predisposing causes. Famine and fever generally go together; and hence, perhaps, we pray in the same breath against "plague, pestilence, and famine." Want of fresh air also predisposes to it. Adult age (or, at least, the vigorous period of it) appears the most inclined to it; for infants, and very aged persons, have fever less frequently than others. It is in adults, and not in the aged, that we most frequently see fever. Besides this, there appears to be a peculiar susceptibility to it in some persons; they will, with no evident reason, become the victims of fever, when placed in the same circumstances in which others escape.

Some of the *predisposing* causes of fever may, by their continuance, become *exciting* causes. It is possible that the continuance of debauchery may, without any additional exciting cause, increase the disposition so much, that at last the disease itself begins;—requiring nothing at all, in addition to the debauchery, to produce it. One cause, certainly, of continued fever, is exposure to cold; especially when the body is over heated. Many cases of fever appear to have nothing to do with any other exciting cause, than exposure to cold; especially when this is united with wet; and more particularly when the body is overheated and fatigued. Besides these very common causes of continued fever, there is generally allowed to be one of a peculiar description;—contagion. Before considering this point, however, it will be necessary to make some remarks on the subject of contagion in general.

By "contagion" is generally meant, I believe, either a peculiar matter generated *in*, or a depraved secretion *of*, a living system under disease; capable of producing the same disease in others, when there is *no indisposition* to it; and more especially if there be a *predisposition*. This, I conceive, is what is generally understood by "contagion."

I have said "either a *peculiar matter* or a *depraved secretion*," because, in the greater number of instances of contagion, it is a depraved secretion. Very frequently it is pus;—pus, frequently, in small-pox; pus in syphilis; pus in glanders; pus in a variety of diseases. In the case of hydrophobia, it is either mucus or saliva; and in other instances it is apparently mucus. In the case of the skin, it sometimes appears to be sweat; but, for what we know, it may be sometimes separated from the body, unconnected with the real natural secretions of the latter. It is possible that an emanation of some kind may take place from the surface of the body, or the lungs, and infect the air, independently of the aqueous fluid which is separated from those organs; but whether such is the case I do not know. To avoid, however, the objections of those who admit such a thing, I think it better to say that it is "*either* a peculiar matter, *or* a depraved secretion." I have said,—"*living* system," instead of "*animal* system," in order to avoid the objections of those who might urge, that contagion occurs in vegetables, as well as in animals; and of course it is the characteristic,—the necessary attribute of a contagion, that it should be able to produce the very same disease in others. Not that it can produce it in *all* others; because there are some that will not take a particular contagion; but it is able to produce it in others, who have a *predisposition* to it; or rather, I should say, who have *no indisposition* to it. I said "others" (referring to the antecedent phrase,—"living system"), because contagions produced by one species of animals have, in many instances, affected other species; for there are several diseases of the inferior animals, (or brutes, as they are called), which may be communicated to the human body. It is necessary to say, therefore,—"produced in a *living system;* and capable of exciting the same disease in *another* living system;"—not of the *same species* merely; but "another living system,"—speaking at large.

When diseases are so produced, they may be, in the first place, either *acute* or *chronic*. What are called "the exanthemata," are acute diseases; such as scarlet fever, measles, small-pox, chicken-pox, cow pock, and the plague; and so are hydrophobia and typhus (if the latter be a contagious disease); whereas the itch, syphilis, porrigo, elephantiasis, the yaws, the sibbens, and a disease (peculiar to Africa) called "laander," always become chronic if not checked; and are not more active at first than afterwards. Some contagious diseases may be considered both acute and chronic. The hooping-cough (if it be a contagious disease) comes on, usually, as an active disease;—with all the activity of the most acute diseases; and yet it may run on for a length of time; so that it may be either

acute or chronic; whereas scarlet fever, measles, small-pox, chicken-pox, hydrophobia, and typhus fever, cannot be chronic;—they are always acute. Syphilis, which I mentioned as being a *chronic* affection, cannot indeed be so considered when it first begins; but it rarely has, comparatively, the activity which characterizes acute diseases. Hooping-cough, however, is generally active at the onset; and frequently it has the activity of small-pox or measles; but it may run on for many weeks,—perhaps even months. Contagious diseases, both acute and chronic, are sometimes *febrile*, and sometimes *non-febrile;* and therefore it is better to divide them into acute and chronic. Hydrophobia is an instance of an *acute* disease of a contagious kind; but it is not in the least *febrile.*

Some of these diseases must be communicated by contact, either with the patient, or something that he has touched; or some palpable matter that has proceeded from him. Of this kind are itch, syphilis, cow-pock, hydrophobia, elephantiasis, yaws, sibbens, laander,—the three latter of which I have never seen,—and the glanders of horses; together, in all probability, with the plague, and porrigo or scald head. Some, again, may be communicated both by contact, and merely by the atmosphere surrounding the patient. In the latter case, there must be the contact of something which has emanated from the patient; but then that something has not emanated in a palpable form. It is not the contact of any solid, or any liquid, that is to be *seen;* but the contact of something *invisible.* Still, that something must have proceeded from the patient. The diseases which may be communicated both by contact with the patient, or by something that he has touched, or something palpable which has proceeded from him; or which may be communicated by merely being exposed to his atmosphere,—are the small-pox, the chicken-pox, scarlatina, and the measles. The latter, as I shall have occasion to state hereafter, have certainly been communicated by inoculation; —just like small-pox. It is probable that, by means of something in the atmosphere which is not palpable, but which has emanated from the patient, we may become the subjects of typhus,—if it be a contagious disease,—and of hooping cough. Even if an individual touch another labouring under these diseases, still it is probably not the mere contact, but an impalpable emanation from the patient, that gives the disease.

The adjective "*contagious*" embraces all the diseases we have enumerated; but it is also employed, in a restricted signification, to distinguish those which are communicated solely by contact with the patient, or with something that he has touched, or with something that has proceeded from him palpably; whereas the word "*infectious*" is given to those diseases, which may be communicated by merely being exposed to the patient's atmosphere. The word "*contagious*" is used in the same way as the term "*horse.*" The latter is used to include both a horse and a mare; but it is frequently applied to the male only; and so these diseases are all continually spoken of as contagious; but the word "*contagious*" is also employed

in a limited sense, to signify those diseases which are communicated by actual contact; or by touching something which the patient has touched; or something which has palpably proceeded from him. You will hear quibbles about this; but it appears to me that the word "*contagious*" is used as I have now stated;—that you may separately have a contagious and an infectious disease; but that you may express them both, according to established custom, by the word "*contagious.*"

Some diseases are both contagious and infectious;—may be communicated either by contact, as I have already said; or by merely being in the neighbourhood of the patient. Now it is observed that, when a disease may be communicated in both ways, it is communicable more quickly by contagion, than by infection. If two persons be exposed to an atmosphere infected with small-pox, and you inoculate one with the virus, the disease will appear in him much sooner than in the other. It is a well-ascertained fact, I think, that contagion, in the limited sense of the word, excites the disease sooner than infection, when the disease may be produced in both ways. Hence, when a person is exposed to the infection of small-pox, it is the practice to inoculate him as quickly as possible; in order to bring the disease on in the artificial manner, before it can arise by infection. Again, some diseases are thought to be only *occasionally* contagious;—I use the word "contagious" generically. Catarrh is supposed, by many, to be sometimes infectious; but I do not know whether it is. Ophthalmia certainly appears to be sometimes contagious. In the greater number of cases it is not; but it would appear, undoubtedly, to be contagious in certain cases. Erysipelas is not considered to be a contagious disease; but Dr. Wells, in a paper published in the "Transactions of a Society for the Improvement of Medical and Chirurgical Knowledge,"* furnishes very strong reasons for suspecting that certain instances which he details, were instances of erysipelas by contagion. Continued fever may be an instance of the same kind; certainly it arises continually without contagion; but in other cases, I am very much disposed to think that it is contagious.

Some diseases, again, are contagious only *for a time.* This is the case with gonorrhœa, and with hooping-cough. There is no doubt that, after a certain time, the discharge from the urethra (call it what you please,—*gonorrhœa* or *gleet*) is perfectly inocuous,—can communicate no disease. It is the same with hooping-cough. Children will continue to hoop, long after any chance exists of communicating the disease to others. It is said that some diseases are only *partially* contagious. The instance of this which is usually alleged, is syphilis. The matter from the primary sores of syphilis—a primary bubo,—will communicate the disease. It is contagious enough; but it is said that the matter of secondary sores is not contagious. It is impossible to make experiments on this subject; and therefore I cannot tell you whether those who assert this are correct or not.

* Volume ii. page 213.

Some contagions appear to be occasionally generated afresh. Some of those diseases which will give rise to a something capable of producing the disease in others, do appear to be produced *de novo*. The itch, at any rate, will sometimes occur in patients after continued fever, where it is not possible to trace it to any other persons. Hydrophobia, there is every reason to believe, will sometimes spring up in the same way. Dogs become the subjects of the disease, without it being in our power to trace it to any other animal;—where there is no probability of their having being exposed to contagion. The same is true of the glanders in horses. This is also said to be the case with regard to typhus;—that a patient has become the subject of it, from a mere common exciting cause; and that he has been known to give it to others. Of this I cannot speak; because I never saw typhus fever contagious. With regard to all these diseases,—itch, hydrophobia, and typhus, (granting the latter to be contagious), whether you choose to believe they will ever occur *de novo* or not, still they must have had that origin at some time or other; and it is not more wonderful for them to occur *de novo* now, than that they were originally produced. There must have been a person who first had measles, small-pox, scartlet fever, and so on; and who could not have derived it from any other person. If we even go to brutes, still the difficulty is the same; for some of them must have had the disease first of all. It must have occurred *de novo*, in some one instance or other. Indeed, it is not certain that small-pox, chicken-pox, hooping-cough, scarlet fever, and measles, do not occur, from time to time, without contagion. We frequently see children labouring under these diseases, who have been shut up in the country; without having had communication, directly or indirectly, with any others who could have had them; or having been near persons who had visited others suffering the affection;—at least, so far as we can trace it. It is possible, however, that an error may exist on this point; and that there *has* been communication; but certainly the ascertainable absence of all communication, direct or indirect, occurs so often, that I do not think we have a right to assert, that the diseases in question never occur *de novo*. I give no opinion on the subject; but I would not be positive on the negative side.

Some contagious diseases occur rarely more than once. Among them we may mention cow-pock, chicken-pox, small-pox, measles, hooping-cough (by which I mean the real disease,—not a spasmodic hoop), and scarlet fever. We must all have seen instances of a second occurrence of these affections, and sometimes perhaps of a third; but the general rule is for them to take place but once; while the rest may occur more than once; and, indeed, some of them an indefinite number of times. It is unfortunately too true, that some persons suffer syphilis and gonorrhœa over and over again;—not, certainly, to all eternity; but as long as they expose themselves. It would not answer the moral end of these complaints were they, like small-pox and measles, to be had but once. With regard to hydrophobia, it is

not known whether it may be had twice or not. So far as I am acquainted with the subject, both human beings and dogs have always died of the disease when seized with it; and therefore we cannot tell whether it may be had a second time.

Another circumstance I may mention is, that we have an instance (or, at least, we *generally* have an instance) of one contagious disease preventing another. The cow-pock is supposed to prevent the small-pox; and, for the most part, it certainly does; but it is to be considered, that it is not by any means proved, that cow-pock and small-pox are not the same diseases;—the former being modified. If they be but one disease, the fact of cow-pock preventing small-pox merely resolves itself into the fact, that some contagious diseases do not usually occur more than once; but if they be distinct diseases, then it is an instance of one contagious disease preventing another.

Now, although you may put each of these diseases into one class or other of those I have been enumerating, yet it does not follow that a disease which is placed with another in *one* class, will be side by side with it in *another* class. These classes are all distinct;—the characteristics of each have no relation to those of another. The diseases which meet in one class, will not meet in another; and the affections which are of different classes in one respect, will meet in another class with others. For example,—hydrophobia is of the class of acute contagious diseases, together with small-pox;—both are acute diseases. But small-pox is in the class of those, which may be communicated either by the atmosphere or by contact; whereas hydrophobia is in the class of those, that can be communicated only by contact,—by the application of palpable matter. Itch and syphilis meet in the class of those, that can be communicated by contact only; yet there is no reason to believe that the latter occurs *de novo;* while I think we have some reason to believe that the former does. The cow-pock is in the class of those, which can be communicated by contact only; and so is itch; yet cow-pock is in the class, also, of those which occur but once; whereas the itch is in the class of those which recur indefinitely. Hence you see that the classes have no relation whatever to each other.

When a contagion has been applied, there is for the most part an interval before it operates;—there is usually an interval, between the application of the poison and the appearance of the disease. This interval is various in different diseases; and it is various in different cases of the same disease. The interval of small-pox is very short, compared with the interval of hydrophobia; and then again, the interval of the latter is by no means always the same. It will ary, from a few weeks to a few months.

Some of these contagious diseases which are infectious,—using the word "*contagious*" in a generic sense, to comprise both,—are very easily prevented by dilution of the atmosphere. You will find a great difference in diseases, in this respect. The contagiousness of diseases which are infectious, or (if you choose) the *infection* of some diseases, is very easily annihilated by dilution; whereas great dilution has

comparatively little effect on others. The infection of small-pox, and of measles, will sometimes operate in a very free ventilation. It is thought, by some, that their infection will not extend to a very great distance in pure air. But, at any rate, in the *purest* air, we see these diseases caught by children, in the neighbourhood of those that labour under them; whereas other diseases cannot be caught, if any pains at all be taken to dilute the air. As a remarkable example of this, I may mention that the contagion of continued fever (if continued fever be allowed to be contagious) may be dissipated with the greatest ease. A comparatively trifling dilution of the atmosphere around the patient, will prevent it from being communicated to any one; whereas a great dilution will frequently not prevent the small-pox or the measles. So easily is the contagion of continued fever (supposing it to be contagious) dissipated, that if there be a very free ventilation around the patient, there is little or no danger of any one catching the disease; and it is asserted that, in small-pox, the contagion, in the worst cases, will not extend beyond half a yard, in the open air. Dr. Haygarth, in his celebrated letter to Dr. Percival,* says that the infection of small-pox will not extend beyond the distance of half a yard; and that of continued fever much less; and this is one reason why the contagious property of the latter has been denied altogether. You will find many persons who deny that continued fever is ever contagious. Granting, however, that it is contagious, we may have another reason for explaining the circumstance of its frequently not spreading far;—it may not be *always* contagious, but only *occasionally* so; like erysipelas perhaps. Another reason is, that persons, for the most part, escape the influence of the contagion, if they be in good health and spirits while exposed to it. I presume that neither good health, nor good spirits, nor good nourishment, nor any other good thing, however favourable to health, will render a person less disposed to catch the small-pox, or to catch syphilis; but it is a fact that, if a person be in excellent health and spirits,—if he have every means of promoting health in his power,—if all be healthful in and about him, he may be exposed to the emanations of a person labouring under the most virulent typhus, and yet for the most part escape. If, however, his mind become depressed, or if his body become debilitated in any way, then you will see the same person become the victim of the complaint, when exposed to the emanations of a typhous patient in so slight a degree, that you would hardly suppose it possible for the disease to be communicated. Many persons are exposed, with impunity, to the emanations from patients labouring under typhus, till their mind desponds; or by some chance they are thrown out of health; and then the contagion,—if typhus be contagious,—acts as a predisposing cause; and the depression of the mind, or the accidental depression of the bodily powers, acts as an *exciting* cause. We have seen that, in the case of ague, a person may be exposed to malaria, and not

* "Letter to Dr. Percival, on the Prevention of Infectious Fevers; by John Haygarth, M.D."

suffer the disease, till he gets cold and wet through;—the common original cause of the disease, the malaria, being the *predisposing*, and catching cold the *exciting* cause. Exactly so, in typhus, the peculiar contagion is often the *predisposing*, and depression the *exciting* cause. I mentioned that, in the instance of the plague, persons have been known not to experience the disease, till they have lost some of their most intimate friends; and have thereby become depressed. Diembroek, I stated, mentions an instance of this kind; and there are hundreds similar.

These things are all to be considered, when we question whether continued fever is contagious or not. It is allowed by those who contend for its contagiousness, that the contagion is one which most easily dissipated by ventillation. In the next place, it is allowed by them, that if a person be in good health, and with every means of health in full play, he will generally escape; and if it be a fact that the disease is sometimes contagious, and sometimes not, and sometimes arises *de novo*, then we see another reason why some people have denied the contagion of the disease altogether. However, I am quite sure that much of the difference of opinion, on this subject, must have arisen from this circumstance,—that many diseases have been called typhus, which were no such thing. There can be no doubt that many of the cases of continued fever which we see, are really cases of *remittent* fever, dependent upon malaria;—having nothing at all to do with contagion. We every day see cases of remittent fever, mistaken for typhus, but easily distinguished from it by nice observers; and persons may be exposed to such cases, without suffering the disease; and therefore typhus is continually said not to be contagious; whereas the patient really labours under remittent fever, which is not a contagious complaint.

Some contagious diseases are communicated from brutes to man. Hydrophobia, cow-pock, and (it would appear) small-pox, are of this description. Every one knows that the cow-pock may be given to the human subject; but it is said that some experiments have lately been made, with success, to give the small-pox from the human subject to the cow; and these have been adduced as proofs that the two diseases are the same; because the disease produced in the cow by the *small*-pox matter, was the *cow*-pock. The itch is a disease communicable from brutes to man; at least, it is said that a kind of itch is produced from mangy dogs. There is a peculiar disease in Germany, mentioned under the name of *milzbrand*,—inflammation of the melt. It is a disease of brutes, analogous to what has been called *malignant pustule*; and is communicable to the human subject. Many persons have had malignant pustules produced in them, by merely touching the blood of animals labouring under a certain disease; or perhaps by merely putting into their mouth a knife wetted with the blood. The glanders of the horse is another disease, which may be unquestionably communicated to the human subject. It is possible that all those diseases, which may be so communicated from brutes to man, may be given back from man to brutes.

M. Magendie has made experiments with regard to hydrophobia. He inoculated dogs with the saliva of a man labouring under hydrophobia; and he says, they became the subjects of the disease. The cow-pock, I believe, may be given from the human subject to brutes; and so, unquestionably, may the glanders. Whether any other contagious diseases than those I have enumerated, may be given from brutes to the human subject, I do not know; but I should think all these may be given back. It is said that there are some other diseases, which may be communicated from man to brutes. The plague, it is said, has affected brutes; sheep have been seen to catch the measles; and the disease called *trichoma* may also be communicated to brutes.

I mentioned that there are some contagious diseases, to which persons are very much disposed by being out of health; and I instanced typhus fever; whereas, other contagions act as well upon persons in health as out of it. But it would appear that sometimes bad health will *prevent* a contagious disease. It is well known, I believe, among vaccinators, that they frequently cannot give a child the cow-pock, when it is labouring under any cutaneous affection. It is found by many who vaccinate to a great extent, that they cannot give a child the cow-pock, when it is labouring under any disease, such as scald-head, or any chronic eruption. This may simply arise from the body being indisposed to take on two diseases at once;—not that the body is out of health altogether; for, a cutaneous disease is frequently but a *slight* affection. Habit lessons the susceptibility to some contagions; at any rate, persons who are continually exposed to the infection of typhus fever, in its most concentrated form, generally escape; and so with respect to the plague. A new comer, into some situations, will sometimes suffer immediately; while those who have been accustomed to it will go on with impunity, and never suffer. Habit appears to have a great influence upon contagion;—just as it has with regard to the aguish effect of marsh miasmata.

Some persons have an unaccountable indisposition to certain contagions. Some children will not take the small-pox, though they sleep in the same room, and even in the same bed, with others labouring under it. The same has been observed with regard to the measles; and (what is very singular) after a lapse of time,—sometimes a year or two, and sometimes longer,—the least exposure will produce the disease in the same individual. It is well known that some persons run into all sorts of risks, with respect to syphilis and gonorrhœa, without using any precaution; and invariably escape, though as bad as their neighbours. In fact, I have known persons of that description; and yet, after a time, they began to catch the disease whenever they ran the chance of so doing. It is the same with respect to small-pox and measles in young persons, as it is with regard to syphilis and gonorrrhœa in adults. The extremes of age are very insusceptible of many infections. Some persons, again, without any indisposition (so far as can be observed) escape, without our knowing why. A person shall be exposed, for example, to the

poison of syphilis to-day,—the existence of morbid secretion being proved by the fact that others, yesterday or to-morrow, suffer from the same source,—and catch nothing; and yet, a fortnight afterwards, the same source may give the disease to him. Persons without any indisposition, sometimes do escape, without our knowing why.

You would hardly suppose it, but still it is the case, that some persons deny there is any such a thing as contagion. Some deny the contagiousness of one disease, and some of another; but there are some who maintain, that contagion was unknown in ancient times, and is altogether a modern invention. There is, or was, one person so convinced of this, (in the case of hydrophobia), that he has written a pamphlet to prove it. He contended that it is a mere imaginary disease; that, at any rate, the symptoms which have occurred, have never taken place *through hydrophobia*. He says that he has inoculated himself, again and again, with the saliva of a rabid animal; and has escaped. His escape, however, is no proof of the non-existence of contagion; because many persons escape all sorts of contagions, every day. Two medical students, at Paris, went so far as to deny that syphilis was contagious; and in the year 1823, they inoculated themselves with some syphilitic matter. They laughed at contagion; and gloried in having some syphilitic matter under their skin. However, the consequence of this experiment was a very bad suppuration in, and a partial destruction of, the axilla of one young man;—he having inoculated himself on the hand; while the other had a bad ulcer somewhere else; and became so distracted at what had happened, that he actually committed suicide, by opening the crural artery. Others have done exactly the same in the case of the plague; and they have suffered exactly in the same way. A Dr. Whyte was convinced that the plague was not a contagious disease; and therefore, in the pest-house of the Indian army at El Hammel, he rubbed some pus, taken from the pestilential bubo of one of his patients, inside his own thigh; and not contented with this, he inoculated his wrist from another pestilential bubo. Four days had hardly passed, before rigors began; with all the symptoms of violent fever; and he died of plague before the end of the third day. You will find it mentioned, in the "Journal de Medecine" for May, 1811, that an Italian physician, or an Italian doctor of some kind, (called Dr. Valli), was so convinced of the non-contagiousness of the plague, that he mixed the matter from some pestilential buboes with a number of other things, and formed it into an ointment, which he designated his *pomade*. He rubbed this mixture on the eyelids of people who came to him with sore eyes; on the abdomen of others, &c.; and thereby communicated the plague to thirty individuals. He was quite sure that he was doing no harm whatever. The Turks, however, thought differently; for disapproving his practice, they cut off his head.

There are on record some other singular instances, of the denial of what it would appear almost impossible that any one would think of denying. Dr. Maclean, for instance, denied that plague was con-

tagious; and went so far as to explain why it, or any other disease, was ever supposed to be contagious. He says that the idea of contagion is merely a comparatively modern invention;—that it was neither more nor less than a popish trick of 1547. He would have us believe, that one of the popes, Paul the Third, in 1547, (after the death of our King Henry the Eighth, of *blessed* memory), when the holy fathers were assembled at Trent, finding he could not manage them,—that he could not get them to vote his own way, broke up the council by setting forth the idea of contagion:—that he stated there was a contagious disease in the town;—a disease that might be caught from those affected with it; and thus excited so much fear among the members of the Council, and all withdrew to Bologna. Thus was the celebrated Council of Trent dissolved. The holy men were so frightened at this invention of his popeship, that away they all went scampering to Bologna.

If you look into Boccacio's "Decamerone," you will find it was published in 1348; and contains a description of the plague at Florence. The first part of this work is not improper for me, a grave professor, to beg you to read; as it gives only an account of the plague. The stories of the "Decamerone" were told by a party, who retired from Florence some distance into the country, during the plague;—were told by some young gentlemen and ladies, who amused themselves by relating them. You will find Boccacio say, that the disease spread from the diseased to the healthy, as flames spread to an unctuous substance. Not only speaking and associating with each other produced it, but the clothes, or any thing else that belonged to persons who laboured under the plague, communicated it. He says, that even brutes got the disease, by touching the clothes of those who died of the plague. He says,—"I saw two pigs grubbing about the clothes of a man who died of the plague; they then staggered and fell down dead."—*Amendui sopra gli mal tirati stracci morti caddero in terra.* Now this was actually published in 1348; and yet a man would seriously have us believe, that the idea of contagion was invented in 1547.

However, some are more hardy than this. They will deny almost all sorts of contagion. There is a M. Lassis, of Paris, who denies all infections and contagions, except measles and lues venerea. But this is by no means a modern folly. I imagine that some of these persons have hoped to signalize themselves by advancing something original, when they denied this or the other contagion; and particularly that those who deny many contagions, or nearly all, must have thirsted for fame indeed. But they are too late. They are merely dull imitators; for many persons among the older writers have denied, sometimes one contagion, and sometimes another. You will find that Gadbury, the astrologer, says that the *plague* is not *more infectious* than the small-pox, scurvy, pleuritis, ague, and gout. He published in 1665; and his book is called "London's Delivery Predicted."

There can be no doubt that great mistakes have been committed,

on the opposite side, as to the contagiousness of particular diseases. You have seen that Dr. Fordyce and Dr. Cleghorn, both able men, believed that *ague* was contagious; and when speaking of *scurvy*, I mentioned that some contended, formerly, that that disease was contagious. We now know to a certainty, that neither ague nor scurvy is contagious. Again, on the other hand, some diseases were not supposed to be contagious, which we now know to a certainty to be so. It is by no means certain, from the writings of Sydenham, that he was aware that small-pox or scarlatina was contagious, or perhaps even measles. He may occasionally write as if they were, but he attributes them to other causes than contagion; and it is by no means clear that he was much impressed with the fact. But you will find other writers referring small-pox, and these other diseases, to all sorts of causes, instead of contagion; such as the faults of parents, before their children were born or proceated;—any thing, in short, rather than contagion. Mistakes, it must be allowed, have been committed on both sides of the question. Diseases not contagious were formerly supposed to be so; and diseases known now to be contagious beyond all doubt, were formerly, at different periods, not imagined to be of that nature; and therefore we ought to listen, with some degree of patience, to those who deny that this or that disease is contagious.

Typhus fever is a disease, which some deny to be contagious; and for myself I willingly confess, that I never saw an instance in which it shewed that character; but notwithstanding this, I cannot but believe that it is frequently a contagious disease. Such it has proved itself at the Fever Hospital. I do not recollect an instance of its spreading; notwithstanding I have been, for so many years, physician to St. Thomas's Hospital; where, of course, there is always a great deal of fever.* But it is to be remembered, that the majority of cases of fever which we have there, are generally by no means violent, compared with what I am told they are at such an institution as the Fever Hospital. We lose an exceedingly small number of cases of fever; either because persons are brought in in the early stage, when the disease is easily treated and cured; or because they are not desperate cases that, in general, people think of bringing to us. I hear, however, that to the Fever Hospital (which is a receptacle for this disease only) patients are taken, as a matter of course, when they have fever, whether moderately or desperately; and therefore many are so taken, of whom there is no hope that the disease will be cured. Our greater success, therefore, is owing, in a great measure, to the comparative mildness of the disease we are called to treat. Now this may be one reason why the disease does not appear contagious with us;—the emanations from the body are not of that extremely powerful kind, which they frequently are at the Fever Hospital; and it is not *all* our patients, but a very small

* The reader will bear in mind that these observations were delivered before the learned Professor had transferred his invaluable services from St. Thomas's, to the North London Hospital.

number, who labour under the disease. In the next place, we have extreme ventilation,—extreme cleanliness; and this is another reason why a *mild* disease, at any rate, will not spread. I have no doubt there is the same cleanliness and ventilation at the Fever Hospital; but they must be infinitely less efficient there; because *all* the patients have fever; whereas with us generally but one or two, and rarely more than three patients with fever, are in the same ward;—large as our wards are. There can be no doubt that, if typhus fever be very bad indeed, persons standing near the patient, even if there be good ventilation, may now and then contract the disease.

But with regard to the arguments in favour of typhus fever not being contagious, it is to be remembered that it is a disease, the contagion of which may be most easily rendered quite inert, by the dilution of ventilation; unless in some very *very* bad instances, on the one hand; or where there is a great predisposition to it, on the other. In the next place it is a contagion, which is allowed by those who stand up for its contagiousness, to be resisted exceedingly, if the body be in good health, and the person be in good spirits. But it appears to me, that there are instances, without end, of a person catching typhus fever from others. It is true, I have never met with one of these cases; but instances innumerable are mentioned, by those who see far more of the disease than I do; though I see quite as much as I wish;—perhaps about fifty cases in a year. You will also find, recorded in books, cases without end;—such as I cannot pretend to controvert. I understand, in regard to the Fever Hospital at Battle-Bridge, that every medical officer there,—physicians, surgeons, and apothecary,—have had the typhus fever; and some more than once;—that every nurse, every matron, every laundress, every housemaid, and, in short, every body that ever had any thing to do with the place, have all had it; and many officers have died. Yet nothing of the kind has happened at the Small-Pox Hospital, which is on the very same spot. This is very important, as clearing up the point, whether all these persons have had it from the emanations of the patients there, or from the situation of the hospital; for I see, every day, persons brought to St. Thomas's with typhus fever, from the midst of others who have the disease; but I never consider that any proof of contagion. The disease *may* have arisen, in my cases, from contagion; but the fact is not *proved;* for it may be the *situation* which has given rise to it. Some fault in the house, some drain, or other external cause, may have caused the disease first in one patient, and then in another. I never pretend to say that is not the case. For infection to be proved, the individual who communicates the disease must go from the place where he resides, to the spot where the healthy person is, and there give it to the latter. If the healthy person go to the sick person, and the sick person be still in the place where he was living when attacked, then no one can say that the disease, which the former contracts, has not been produced from the *situation*, and not from the *patient*. The disease *may* have arisen from contagion,—from the emanations of

the patient; but this is not *proved.* If the patient go to a healthy spot, especially from an unhealthy one, and the disease then occurs there in others; or if any thing which the patient has touched, be taken from the place where the patient resides, to a healthy place, and there the disease takes place;—then it proves, if there be a sufficient number of these instances, that the disease is contagious. Many persons who have caught the fever at the hospital, have carried it home and given it to others, who had not gone near the hospital. Whether, however, this were the case or not, there are instances without end of persons having visited patients with the disease, and then given the disease to others where they have gone.

Inanimate substances have become impregnated with the secretions, or emanations from a person labouring under a disease; and have communicated the disease to other persons. All such substances are called *fomites.* Among these, woollen substances are by far the most influential. All woollen substances imbibe secretions and emanations, and convey infectious and contagious diseases, far more than any other description of substance. You will recollect that, even in the case of malaria, some assert that bushes will entangle it; and, on cutting them down, persons have been seized with intermittent and remittent fevers;—arising, in all probability, from the disengagement of a considerable quantity of malaria, which had been collected. Even the cutting down of woods, will have the same effect; and therefore there is someting analogous to fomites, in the case of *malaria*; but it is in cases of *contagion* that, to inanimate substances, the term "*fomites*" is applied. There are instances, without end, of the plague having been conveyed simply by old clothes. It is even said, that the plague of London was conveyed to Derby by that means. There is scarcely any point in medicine, of which there are more numerous instances, than of plague and typhus fever having been conveyed by left-off clothes. The exanthemata are frequently so communicated; and when I come to speak particularly of yellow fever, I shall be able to lay some instances before you, in which this has unquestionably been the case; although it would appear, from the testimony of one whom I have the pleasure to call my friend,* that yellow fever is of different kinds;—that there are two kinds; one which is not contagious, and one that undoubtedly is so. I dare not say how long fomites will retain contagion. I know that a person who has been about another labouring under measles, will communicate the disease at the end of even a month; and that a room once infected with scarlatina, will give the disease for a twelvemonth. The contagiousness of fomites is best destroyed by heating them well.† Articles may be exposed to a high temperature; and large fires, with plenty of smoke, best disinfect apartments.

Whenever such a thing occurs, as disease being produced in a

* Dr. Stevens.

† The experiments of the late Dr. Henry, of Manchester, have placed this fact in a very strong light.

healthy spot, by the approach of an unhealthy person to a healthy one; or the application of fomites to a healthy person; then it is a proof of contagion, provided the instances be sufficiently numerous; for one or two cases may be quite accidental. But you will find an argument against the contagion of typhus fever, adduced from this circumstance;—that it will sometimes disappear during an extreme temperature; and will sometimes disappear altogether, without any obvious reason; whereas, if it were contagious (it is argued) it would spread from one to another; till all, or the greater part, suffered it. It is said, that it is only a disease which depends upon a particular state of the atmosphere; and not upon an emanation from a diseased person; and that *therefore* it is suspended by the extremes of temperature, or will suddenly cease without any obvious reason. It is indeed true that non-contagious yellow fever, and intermittent and remittent fevers, and other diseases decidedly not contagious, will be aggravated or repressed by extremes of temperature; and by causes not discoverable. But this is exactly the case, not only with typhus fever, but with diseases which all people of common sense allow to be contagious. Epidemic small-pox is frequently checked by extreme cold. The plague, which I believe almost every body allows to be a contagious disease, in the strict sense of the word, (not *infectious*, but *contagious*), is also stopped by extreme heat or cold. Small-pox is frequently so stopped; and also by the wind called *harmattan*, which also arrests the plague; and (what is curious) this wind will prevent persons from *taking* the small-pox, even if they be inoculated. When that wind prevails, inoculation is commonly found to be fruitless. We have, therefore, the same fact with respect to diseases undoubtedly contagious, or infectious, or both, that we have with respect to such diseases as our remittent or intermittent fever; or others which depend upon something in the atmosphere, not proceeding from diseased persons. This objection, therefore, has no force. Hooping-cough and measles, which most persons allow to be contagious, are generally checked at the height of summer; and Sydenham says that scarlatina is most prevalent when the summer is over.

But there are still more remarkable facts, with respect to the stopping of diseases known to be contagious;—nay, of some diseases which are, not *infectious*, but *contagious* in the true sense of the word. Cow-pock, which can only be communicated by contact, will sometimes decline so much that, at one period, Dr. Jenner could not prosecute his inquiries into the disease, for want of matter. Although there was apparently no reason for the disease not spreading as usual,—" in a natural way," as it is said,—from the teat of a cow to the hand of the human subject, it was sometimes so checked, that Dr. Jenner could not obtain a case of it. When he was publishing his work on the subject, the very same thing happened; and Dr. Woodville says, that the disease did not re-appear till the following spring, at which time it chiefly prevails. Sometimes, without our knowing why, small-pox (an unquestionably contagious disease) will not affect a place quite contiguous to another; although it is pre-

vailing in the one, and free intercourse is being carried on between them. Van Swieten mentions this; and Sir John Pringle says, that he saw small-pox carried by recruits into the camp; and yet it did not spread. Dr. Odier, of Geneva, inoculated children when the disease was not epidemic; and though they were going about the streets, every day, during the eruption of the disease, and although there was the freest communication between the children who had been inoculated and others, yet not a single instance was seen of the disease spreading. There was something in the atmosphere, whatever it was, that prevented it. Sir James M'Grigor says, that the small-pox was raging in houses at Bombay, contiguous to the barracks; and yet no child or adult in the latter place imbibed the disease. There was something in the situation which prevented it. If you will read Burkhardt's "Travels,"* you will find something equally curious on this point. This author says, that "it is a curious fact, but one which has been attested to me by many persons, that small-pox has never been known to visit the Wadykenous; which is a narrow shore, from the Cataract up to Korosko." But, he adds, "this disease is well-known at Derr;" which is close by, and where it is much dreaded. It was never known to pass a certain point, notwithstanding there was free intercourse.

If such singularities will occur in the case of diseases known to be contagious, there is no reason to doubt that typhus fever is contagious, merely because it will suddenly cease in a neighbourhood, or in a district, without our knowing why; or because it may be apparently arrested by extremes of temperature. Not only will undoubtedly contagious diseases sometimes not spread in the natural way (to use common language) at certain seasons; but sometimes you cannot produce a disease, notwithstanding you inoculate for it. It would appear to be the same in the case of hydrophobia. We sometimes hear of nothing but mad dogs. A mad dog is killed every day;—sometimes for a month; and then we never hear any more of the disease for a twelvemonth. Now one would suppose that the disease would be communicated from one to another easily enough; but it is impossible not to imagine that, at one period, there must be a far greater susceptibility to the disease, than at another. You see, therefore, that there is no *à priori* objection, to the possibility of typhus fever being cantagious. The only question would be,—is it a fact, or is it not? And I think there are sufficient instances,—instances without end,—of persons having communicated the disease to others. Provided there is not free ventilation;—provided there is plenty of dirt, bad living, and unhealthy circumstances, I think there can be no question as to the disease frequently proving contagious. There is certainly a great difference of opinion on the subject; and it undoubtedly is not contagious to the extent that many believe; and great cleanliness, with plenty of ventilation, will so dissipate the disease, that no practitioner, if in good health and

* "Travels in Nubia," &c.

spirits, and well fed, need be afraid of it;—unless it exists in great intensity, and the emanations are applied to him in a concentrated state. In order to imbibe the disease, if the practitioner be in good health, and there is free ventilation, he must go so near to the patient, as to inhale his exhalations in full concentration; but if he be out of health, the disease intense, and ventilation indifferent, he may easily catch it. This must make a great difference in determining whether the disease is contagious or not; for you find ten thousand instances, in which the disease does not appear to be contagious; yet it is to be considered that, in these cases, if the bystanders had been predisposed by debility, &c., and there had been no ventilation, it might then have proved contagious. The question, however, must be determined by a great number of cases.

The interval which occurs between the application of the poison of typhus fever, and the appearance of the disease, is exceedingly various;—exactly as occurs in other diseases. Dr. Haygarth says that, of seventy-two persons who were exposed to the contagion of typhus fever, five were seized with the disease within ten days after exposure; thirteen were seized between the tenth and the seventeenth days; forty-one were seized between the seventeenth and the thirty-second day; and one so late as the seventy-second. This variation of interval, is the same as is observed with respect to all diseases acknowledged to be contagious. Hydrophobia is a disease which sometimes begins in a few weeks; sometimes in a few days; but generally a few weeks elapse, and sometimes several months, before it makes its appearance. The same variation is observed in the case of small-pox; nay, there is often a difference (as I have mentioned already) as to the time at which this contagion takes effect;—depending upon whether it is applied by means of the atmosphere, or in a palpable form by inoculation. The poison from inoculation, produces the disease much sooner than infection;—much sooner than if the poison be applied by means of the atmosphere. How long the poison may lie dormant, I cannot say; but to take a case from another poison,—malaria, we must remember that many months frequently elapse before ague is produced; so that the malaria becomes the *predisposing*, instead of the *exciting* cause; and the same may be the case, sometimes, with respect to typhus fever. It may exist dormant for a length of time; but what is the utmost period it will do so, I cannot pretend to say. It must have a limit, of course; but we know not what that limit is.

An objection to the contagiousness of typhus fever has been raised, not only from the irregularity of the period at which it begins, but from the irregularity of the duration of the disease; yet scarlatina, although undoubtedly a contagious disease, is very uncertain as to its course. Scarlatina will, in different instances, show the eruption at very different days. Sometimes the eruption will appear on the first day;—the very day on which the patient is taken ill; and sometimes it will appear before there is the least redness or soreness of the throat. Then, when the eruption *does* appear, it will some-

times last only a day, or a day and a half, or two days; and sometimes it will continue ten days. No valid objection can be raised to the fact of typhus fever being a contagious disease, merely because it is very various, not only as to the period at which it takes place, but also as to its duration; for scarlet fever likewise exhibits these very same varieties. Nay, the same would also appear to be the case with regard to small-pox; for Sydenham speaks of an epidemic small-pox, in which the eruption took place on the fourth day; which, you know, is not the usual period at which it occurs.

But although the contagion of typhus fever is rendered much more active by concentration, and both that and filth are injurious to a patient, and must render him more liable to be affected by the contagion, yet it frequently happens, that the utmost filth and the greatest closeness, will not produce the disease. Some have ascribed the disease to confinement of air and to filth; and both these will unquestionably be injurious to the health at large; and contribute to render a person exposed to the contagion of typhus, the victim of the disease; yet persons are continually exposed to mere filth and confinement, who do not suffer. In Kamschatska, the people live seven months in the year in *yourts;* which are cavities dug seven or eight feet under ground, and covered with a thatched roof; and which have only one small apartment, for three families perhaps; with a stock of provisions, consisting chiefly of dried putrid fish. In these pits they eat, sleep, and do every thing promiscuously; so that there is the most intolerable stench; which, though not perceived by themselves, is but too evident to travellers. Yet they have no fever. On the contrary, they are all healthy; with the exception of being liable to scurvy, which arises from the want of fresh provisions. The Greenlanders and Esquimaux crowd themselves together, and exclude the air. They have no chimneys in their huts; but an inner apartment, the fog and smell of which are quite suffocating to strangers. Yet they very rarely have fever. In general, they only experience scurvy. The habitations of the Russian boors, are equally intolerable to strangers; and yet, it is said, they never have putrid diseases. Dr. Lind says that, in the slave-ships crossing the Atlantic, although the poor creatures are crowded below deck as much as possible, and at night are shut up under close hatches; and although they suffer from a change of climate, and some are suffocated; yet, in general, they have no infection; and if an accidental infectious disease enters among them, it is of a much milder character, than when it occurs in felons who have been transported in an opposite direction;—owing, probably, to the opposition of a high temperature to the contagion of typhus. It is said (but I do not know with what degree of truth) that contagious fever never occurs in these slave-ships. At the black-hole in Calcutta,—an apartment forming about a cube of eighteen feet; and only opening to the west, by two windows strongly barred,—one hundred and forty-six persons were confined (in the month of June, 1756) from seven or eight o'clock in the evening till dawn the next day. One hundred

and twenty-three individuals were suffocated; and the rest were of course made ill. It is said, however, that all which the survivors afterwards felt, was heat and extreme exhaustion; and that a great many had boils, but no fever was produced. Howard, the philanthropist, says that there was no fever in the prisons at Venice; though they were the closest possible. He also says, that the prisons at Naples were close and offensive; that the people were ill; but that no fever was produced. He adds, that we must look for an additional cause of fever, than mere filth and confinement. Dr. Mounsey says exactly the same of the prisons at Moscow and Petersburgh; though the prisoners were crowded together, and had but little ventilation. But it is to be remembered that, when fever is introduced into such situations, it rages with the most dreadful violence; and it is also found that new-comers into such filthy places, when contagion is present, suffer much more than those who have been habituated to them;—that contagion acts the more, on account of the bad state into which this filthy confinement throws the constitution. Those that were habituated to these situations, before the contagion was introduced, became gradually accustomed to it. People every day live in confinement and stench, which would half poison us; but when strangers go into this filth, after having been in pure air, they are much more liable to experience the disease; and if they suffer, it is worse in them than in others. Still although, till certain contagions are introduced among people who live in close, dirty, and bad situations, they consider themselves as well as others differently situated; yet when those contagions are introduced, they at once act as a test of the tendency of the previous mode of life; and these people suffer in an infinitely higher degree than others; provided there be not present any accidental counteracting cause; such as great heat in the case of typhous contagion. A mere surgical accident will test the previous mode of life, in two people who might have appeared equally healthy.

As mere confinement will not, in general, produce fever, without some predisposing cause, so dead putrid animal matter is also said to be innocuous, while unaided. An instance of the latter is adduced with respect to Paris. In the course of six centuries, there were six hundred thousand bodies buried in Saint Innocent's churchyard, in that city; and they were spread under ground over two acres. The soil, by this vast deposition, was raised above the streets; and of course there was an offensive smell; but no fever arose from it. They were removed partially, in the heat of summer, till the ground was levelled; and the workmen were frequently asphyxiated,—frequently fell down senseless; but none of them were attacked by fever, although no precaution was employed. It is said that, in Seville, there is a fetid odour from the ground where ten thousand bodies were deposited, during the time of an epidemic; that the soil cracked, and great stench was produced, but no fever. Howard, the philanthropist, says that, at Smyrna, there was a most horrid smell from the burial-ground, after the plague; and many corpses

lay uncovered; but no bad consequences ensued to the family of the governor, whose house was exposed to the exhalations from the spot. Disecting-rooms will not produce fever; unless an individual be either exposed to contagion, or is very much out of health through anxiety of mind, hard study, or some accidental circumstance. Persons attending a dissecting-room, will become out of health, and be ill, and perhaps die, from the very severe effects of slight wounds; bnt I am not aware that fever which will spread to others, has ever been produced in this way. Various diseases which have been confounded with fever, have been produced; but I am not aware that fever itself has so occurred, when there was no depressing passion,—no anxiety from over study, want of proper rest, or excess of any kind. Still if mere stench, unaided by other things, and through delicacy of constitution,—not counteracted by the presence of the ordinary causes of health,—should impair the latter, I can conceive that fever may be produced at last. Nightmen, as far as I know, are as healthy as other persons; and yet their grounds are certainly offensive enough. A spermaceti-manufactory, the stench of which was intolerable, existed near Bristol for two years; but no fever was produced. It is said that, at a manufactory (situated at Oldland, in Gloucestershire) where bones were employed for the purpose of procuring muriate of ammonia, an intolerable stench was produced; and yet no fever resulted from it. It is said that the superintendant removed to a more convenient house, situated upon a hill; and that there he and his family lost their health; so that he had some idea of returning back to the offensive place, that he might recover his health. At sugar-refineries, where blood is kept till it is putrid, persons do not suffer. Leather-dressers are exposed to offensive smells; and yet they escape. Many persons are employed in the most offensive occupations with putrid animal matter; and yet fever never breaks out amongst them, if they possess the general means of health, and are well fed and cheerful. But if these persons, in the midst of stench, were in a state of famine, and consequently in great depression of mind, then in all probability fever would occur. Those who are interested particularly with this point, will immediately remember the examples adduced by Mr. Thackrah, in his work on the diseases of the different occupations of life. Butchers are exposed to more or less stench; glue-manufacturers, buckram-makers, and tallow-chandlers, are all exposed to odours more or less offensive; and yet they enjoy excellent health;—are ten times more healthy than bakers. Orfila mentions the healthiness of knackeries, where there is immense putrefaction in summer, and the soil has been saturated for years.

To shew that these exhalations do not hasten the decomposition of even dead animal matter, the following fact is mentioned. In the neighbourhood of a dissecting-room behind the Hôtel Dieu, where the odour was so offensive that, after numerous petitions, the dissecting-room was removed, ragouts, bouilli, and all sorts of good things, kept as sweet in the midst of this horrid smell, as in any other situa-

tion. A veteran of the imperial guard (to mention another instance) turned gut-maker; and said that, although his premises were truly offensive,—filled with enormous masses of corruption, yet nothing spoiled in his house. It cannot be denied, however, that although these things do not generate fever, yet they operate strongly when other causes come into play. Though they may all be thrown off, as water is from an oiled surface, when a person has no other cause of ill health, and is well supplied with good food, and has good spirits, yet they do produce mischief when other causes are combined with them. It is also to be insisted upon, that if actual contagion be introduced into a place which is offensive, then these things appear to tell; and the mischief is greater, on account of the closeness of the situation, and the exhalations from the putrifying animal matter.

It is therefore certain, I think, that mere confinement,—mere exposure to the emanations from persons crowded together amidst the greatest filth, will not in itself produce fever. I think it is quite certain that animal matter, in the greatest state of putrefaction, does not of itself afford any thing which will produce a disease called contagious. It may be that the persons so exposed are fed well; and are in good spirits; and have all other means of contributing to health at their command. Still, however, if any matter which is in a state of putrefaction; as is, or was formerly, the case in dissecting rooms; as occurs in ammonia-manufactories, and manufactories and places where putrid blood is used, and from which there are horrid emanations;—if this alone could produce contagious diseases, we should have fever every day, where we have nothing but perfect health. There can be no doubt that, if these things throw a person out of health, then any contagion, or any other cause of fever, will act intensely in producing this disease. This is allowed with regard to cholera. Nobody believes that any putrid emanations, or any thing that proceeds from persons crowded together, or the putrefaction of animal matter, will produce that disease; but all know that these things have a tendency to throw people out of health; and by the body being thus brought into an unnatural state, it is rendered an easy prey to any other causes that are applied.

There is another question, whether the contagion of typhus (allowing that it is a contagion) may be generated afresh? There is no *proof* that certain contagions can be generated afresh; but others unquestionably may. Want of good food, want of rest, closeness of situation, depression of spirits, and exposure to bad air, may, by all conspiring together, occasion fever; but whether they occasion *contagious* fever, I do not know. I have never seen an instance of it. I have seen many young men ill from close studying, from being much in a dissecting-room;—especially when they came fresh from the country, and were not accustomed to a dissecting-room, or to hard study; and were very anxious about their studies. Young men, when about to pass examination,—their anxiety being then so much the more increased, have certainly had fever; but I never

saw their disease spread contagiously. Others say that they have seen it spread in such circumstances. They tell us that typhus is a disease, the contagion of which may be generated *de novo*; but, though this is highly probable, yet one should always be cautious in listening to assertions in medicine; because so many assertions are made, without any ground whatever.

With respect to confinement, persons have been crowded together in the most filthy prisons, where the discipline was frightful; where they were treated like beasts;—in a way that *we* should not think of treating beasts; and yet no fever was produced. But you will find, in authors, an account of a disease which broke out at Oxford, in the year 1577, in the reign of Queen Elizabeth; at what was called "the black assizes." Some prisoners were brought out of prison, where they had been in a state of great confinement, with very little ventilation, and exceedingly dirty. A strong stench arose, and was supposed to proceed from the prisoners. Some of the judges and magistrates, the sheriff, and most of the jury, were taken ill; and died in a day or two. Six hundred persons sickened the same night; in the next three days, three hundred more sickened; and before five weeks had elapsed, five hundred and ten had died. The symptoms are said to have been violent pain of the head and abdomen, with delirium. Many contended that this was a disease produced by the confinement of these prisoners;—that a contagion was generated from them;—that although they did not suffer themselves, a contagion passed from them, and produced this disease. But others, of equal judgment, are of a different opinion; and urge, on the other hand, that the disease was not contagious. It is said that the court was held in the yard of the castle, that was only a small distance from the river Isis, the banks of which were low; and it is actually recorded that a great damp arose; that a *breath*, as it is called, or a *fog*, arose among the people; and that, at the same time, an intolerable stench was perceived; and some seemed smothered. The weather was intensely hot. The disease was not the plague; and the physicians would not name it. From all these circumstances, some writers contend that the disease had nothing to do with the prisoners; but that it was an exhalation owing to the dampness of the earth;—some peculiar kind of exhalation; that we have no proof of its contagiousness; and that typhous contagion rarely affects so instantaneously. Women, children, and poor people, are said to have escaped. How this may be I do not know; but to shew the bigotry of the times, I may mention that others took up a very different opinion; and alleged that it was neither contagion nor exhalation; but entirely owing to the poor Roman Catholics, who used the art of magic. They stated that it arose from diabolical and papistical arts;—that it was produced by popish blasts, which emanated from the lowest depths of hell. You will find this particularly mentioned, in Wood's "History of Oxford."—"Some have thought, and do think, that it was devised by the Roman Catholics, who used art magic in the design; and that also,

as a certain note witnesseth, (register of Merton College), it sprung *ex artificiosis, diabolicis, et plane papisticis, flatibus; e Lovanensi barathro excitatis; et ad nos scelestissime, et clam emissis.*" This absurd opinion seemed favoured by the circumstance, of the damp or fog having arisen in the court, as soon as sentence of loss of ears was passed upon a book-binder; who had continually spoken against Elizabeth's government, and the reformed religion.

Another singular instance is recorded, which occurred at the Old Bailey in 1750; where several persons were taken ill, after the prisoners had been brought into court, subsequently to close confinement. This has been supposed to be exactly a similar instance, but it appears that there are objections to it; and many contend that it arose from a window being open, and a draught of air coming on those who suffered. How this might be, I do not pretend to say; because there are ten thousand circumstances that would alter one's opinion, if we had an opportunity of making minute inquiry. I can only state my belief, that typhus fever is sometimes contagious; that it may be made so under very unfavourable circumstances;—that it is, perhaps, always contagious in one sense; only that the contagion is so mild and diluted, that it comes to nothing; and that it belongs, like cholera, to those contagions which are not only powerless by moderate dilution, but powerless upon a frame free from disease, in full vigour, and with all or most of the causes of good health about it. We know from Thucydides that, before the plague of Athens,—from Livy that, before the plague of Rome,—and from Hodges that, before our plague in 1665, great crowds were collected in each respective city; that, in the latter case, the sky was serene, and the air stagnant; and that the rich escaped so much, that the disease is said by Clarendon to have acquired the name of "the *poor man's* plague." Whether the contagion can be generated afresh, I will not pretend to assert; but I believe that it may. If a person be near another labouring under typhus, and a considerable time afterwards is exposed to fatigue, and other predisposing causes of fever, and is seized with it, we cannot say whether the contagion has lain dormant all the time; or whether the mere force of the predisposing causes alone may have produced the disease. Either side may be adopted, and neither disproved.

I ought to mention that the bodies of persons dead of typhus, rarely (if indeed ever) give the disease; and that typhus, like other epidemics, whether contagious or not, grows milder and milder the longer it lasts; although it be spreading more and more. I may just mention, by the way, that besides *malaria* being a cause of *remittent* and *intermittent* fever; and besides *contagion* being a cause of *continued* fever, it is very possible there are certain other exhalations, which do harm;—which produce actual disease, I mean. Sydenham had an idea, that epidemics arose from some peculiar changes in the bowels of the earth. It was only a fancy of his; but it is very possible that some of these peculiar causes of disease, are exhalations let loose from particular spots. Berzelius mentions a

curious circumstance. He was making experiments with seleniuretted hydrogen; and after a certain period (not immediately) catarrh came on, and continued a very great length of time. A quantity which he inhaled, while making the experiment, did not produce any great irritation *at first;*—he did not suffer any *immediate* inconvenience; but after a certain period had elapsed, then it began to operate, as all specific poisons do; and he had long continued catarrh. Now some, from such facts as these, conceive that a volcano may let loose a substance, capable of producing a peculiar operation on the human body. It is not altogether improbable that exhalations, of various sorts, may arise *out* of the earth, independently of the exhalations of diseased animal bodies, and independently of the exhalations, from the *surface* of the earth, of putrifying vegetable matter. The subject is not at all understood; but it is certainly an inquiry worthy of being attended to, whenever an opportunity occurs.

Having considered the *remote*, we next come to consider the *proximate* cause of fever; respecting which, there have been, I might say, thousands of hypotheses. In these hypotheses, the writer has generally assumed some one fact which has had no existence; or has taken up one particular circumstance, from among all the circumstances of the disease, and placed that as the cause of the whole. Some assume it as a fact that the disease is all in the solids; others assume it as a fact that it is all in the fluids. Those who ascribe every thing in a disease to the fluids, are said to be *humoral pathologists.* Their fancy is this;—that a certain something is in the fluids, which is deleterious to the body; that a process, analogous to fermentation, is going on, which they call *concoction;* that the peccant matter is then separated, and the process is called *despumation;* and provided it is thrown off entirely, there is an end of the disease. Now there is not the least proof of any such process occurring. There is proof of the depravation of the fluids; but there is no proof of concoction and despumation;—of a salutary fermenting and despumatory reform of the fluids,—if I may so speak. There is nothing peculiar thrown off, when an excessive secretion takes place; as at the crisis when great diarrhœa or sweating occurs; or at least, if there be, we know it not; and it is a mere fancy to say that it does occur. So when there is hæmorrhage, there is no proof that that portion of blood which exudes, is more vitiated than the rest; and it is to be remembered that it is only a *part* of the blood which escapes. All these changes of the fluids are, most probably, owing to the solids in the first instance. A morbid cause makes a peculiar impression upon the body, as a living system; it impresses the solids; and, by the operation of the solids, the fluids are secreted in a vicious manner, and of a depraved quality. It is probable that the vitiated state of the fluids, arises from the solids not having manufactured them properly; unless, indeed, a quantity of improper materials be supplied to the body; which the body, without any fault of its own, can make nothing of. In that case, the solids certainly are not in

fault; they do their best, but they are obliged to manufacture (if I may so speak) a bad article; because they have bad materials. With this exception, I imagine that the fluids must become depraved through the solids; though of course they, in their turn, must exert an evil influence. Again, it is a fact that fever will continually cease, without any discharge;—without sweating, or diarrhœa, or loss of blood at all. It is most probable that, when these things take place, they are the result of the healthy change altogether. In fever, you may get a patient to sweat profusely; but perhaps he will not be any better for it. If, however, you get him better, then probably he sweats. His improvement is not the result of the sweating; but you have brought him into an improved condition; and sweating then takes place spontaneously, as it were. Frequently, in fever, diarrhœa occurs without any relief; you stop it, and the patient is all the better for the suppression. The critical discharge, too, when it does occur, and when a patient is improved at the same time, is for the most part too small to explain the improvement. It would seem that the discharge is rather the *consequence* of the improvement than otherwise. The improvement occurs; and the discharge takes place, almost as a matter of course.

Some have imagined that, in fever, the blood is too thick;—that it will not flow; but that is a mere assumption. Other authors have asserted, that the affection is owing to a spasm of all the small vessels. I presume that there is spasm in fever;—that so long as the solids do not secrete, we must suppose that the vessels are closed, so that the fluids cannot escape; but though there be spasm at a certain period, when the secretions are all deficient,—though we allow that this is *one* striking circumstance, yet there is no reason to imagine that it causes *all* the symptoms. Then some have assumed that debility is the cause of fever; but people are weak enough every day without having fever; and if debility be *one* of the circumstances of the disease, yet there is no proof that debility is the *cause* of the symptoms.

Then, again, some assume that it is inflammation. Some will say that it is a universal inflammatory state; while others contend that it is only a *local* inflammatory state; and some maintain that this local inflammatory state is situated in one part, and some in another. Now that the body, in fever, is frequently in an inflammatory state throughout, there can be no doubt at all; neither can there be a doubt that in fever there is continually local inflammation; but there certainly is something more than all this in fever. You have a peculiar feeling of debility; you have a peculiar look of countenance; you generally have pains, at the first, in the loins; you have a tremulous tongue, and a universal disturbance, such as you will not have from any simple local inflammation in any one part. Many of these symptoms are certainly not referable to an inflammatory state; and if the disease be contagious, then this shows that there is something more than mere inflammation. The local inflammation which occurs, is by no means proportionate to the violence of the

fever. You will frequently have violent fever; and, although there is local inflammation present, yet the latter is not at all in proportion to the former. In some instances, you will have death take place at the very first, without any inflammatory state being produced;—just as in small-pox (which unquestionably is a contagious disease) you will sometimes have the patient die, before any inflammation becomes visible;—death taking place merely from the depressed state of the system. Mere inflammation, whether general or local, although it is a circumstance that frequently occurs in fever, is nevertheless quite insufficient to explain the whole of the symptoms. It is *one* fact in the disease; but not the *whole* of the facts; nor is it a fact from which any one can prove that the other set of symptoms arises.

With respect to those who consider that it is neither situated in the fluids nor the solids generally, but in some one part of the body, I may mention that Hoffmann thought it was a disease of the nervous system. The nervous system certainly is affected, and so likewise are the secretory organs; and therefore others have just as much right to say that it is a disease of the secreting system, as Hoffman had to ascribe it to the nervous system. Dr. Wilson Philip supposes it to be an affection of the capillaries throughout the body; but then there is a peculiar affection of the nervous system in general; and there is particularly a disturbance of the abdominal organs. Some have fixed upon inflammation of the brain. Former writers have done that; and a modern physician, in London, has done the same; he considers it a mere inflammation of the brain.* Others, again, residing in Paris at this moment, fix upon the abdomen. Broussais, for instance, considers it to be inflammation of the stomach and bowels;—what he calls *gastro-enteritis.* Some patronize one organ, some another.

Now I believe, as I just now mentioned, that the head is frequently in a state of inflammation, and so is the abdomen; but occasionally the head is far more affected than the abdomen; and in other cases the abdomen is more affected than the head. I stated that the local inflammation frequently bore no proportion to the general symptoms of fever; and sometimes we have violent local inflammation; without any corresponding symptoms of fever. The same is the case with regard to the relative affection of the head and the abdomen. Sometimes the head is more affected than the abdomen, and *vice versâ;*—they do not bear any proportion to each other. If we assume local inflammation to be the cause, and if we observe the phenomena of many cases, we have no more right to settle the affection in the head, than we have in the abdomen. Frequently you will find the disease running on, and proving fatal, without any decided marks of inflammation at all;—without anything that bears a proportion to the general sinking of the system. Besides, there are peculiar symptoms in fever, which mere inflammation would not at all explain; such as

* See "An Enquiry into the Seat and Nature of Fever; by Henry Clutterbuck, M.D."

the particular look of the face, the tremulous tongue, and the extreme feeling of debility of the body. Again, it is to be remembered that the fluids do, in fact, undergo a peculiar change. As the disease advances and the debility goes on, the saline matters of the blood are more or less deficient; and the blood becomes more and more watery. It is said by a friend of mine, Dr. Stevens, that we can remedy this state, not by the remedies for inflammation, but by supplying the deficient substances in the blood. Of that, however, I shall speak presently. All these I consider to be mere circumstances constituting a general collection of truths; but I do not see any reason to suppose that there is disease of one part, more than of another.

Some think that inflammation will explain every thing;—not only changes of structure (upon the absurdity of which supposition I have already dwelt); but every thing else that occurs morbidly to the body. It certainly is the first circumstance that takes place in many changes; and it *accompanies* many changes; but there is no proof that this is *always* the case. Syphilis, for instance, is an inflammatory disease. The first thing that occurs, is a pustule, or a mere inflammatory speck, followed by ulceration; and the next occurrence is an inflamed gland; and then, when other symptoms arise, they are more or less inflammatory. If you bleed during the secondary symptoms, you often find the blood buffed; and you have inflammation in different parts of the body. Syphilis, however, is something more than inflammation. So it is with cancer, so it is with encephaloid disease, and melanosis; and so, I think, it is with fever. Inflammation forms a part of a large number of cases; but it is not sufficient to explain them; otherwise a mere case of phrenitis would be, in every instance, a case of fever; and every case of inflammation of the stomach, or of inflammation of the bowels, would, if there were a certain degree of excitement, be a mere case of fever; which undoubtedly is not the case. Another argument against fever being mere inflammation is, that it is frequently cut short, in a very early stage, by an emetic; or by cold affusion;—not ablution, but affusion. Now this could not be done, if the disease were nothing more than local inflammation; or if it were inflammation at all. Again, inflammation will not explain the difference between typhus fever and plague; which, though different diseases, are nevertheless in many respects analogous. Inflammation will not explain scarlet fever; nor will it explain measles; yet they are both inflammatory diseases. The symptoms are decidedly those of inflammation, in a great number of cases; but there is something more than that. The system is in a peculiar state; and inflammation is merely one of the circumstances. Some have imagined that inflammation produces even intermittent fever; but we have no explanation of it; and this is a mere assumption. Anything may be said in physic; but anything may not be right.

Although I deem it necessary to make these remarks, yet I shall not attempt to state what I believe fever to be. I really do not know what it is; and I think it is always a great blessing to know one's

ignorance. It is a great blessing not to fancy ourselves acquainted with things with which we are not; because if we fancy we are, we sit down contented, and never think of examining the subject further. It is a great point in study, I think, to ascertain whether we really do understand a thing or not; and not to deceive ourselves by fancying that we are fully acquainted with it, when we are in a state of perfect ignorance. You will find an excellent observation of this kind in Voltaire's "Philosophical Dictionary," under the word "*idea*." A person is there represented as lamenting, that he has got so many ideas;—that his cerebral matter is full of ideas; but that he is perfectly miserable, because he cannot tell what an idea is. He fancies it is this, that, and the other; he indulges first in one hypothesis, and then in another; and says it is a shocking thing not to know what an idea is. His friend tells him, that it is a much more shocking thing to sit down contented with imagining that an idea is what it is not.—"Il est bien triste d'avoir tant d'idées, et de ne savoir pas au juste la nature des idées." "Je l'avoue," replies the other; "mais il est bien plus triste, et beaucoup plus sot, de croire savoir ce qu'on ne sait pas."—I imagine that we do not know the peculiar state of the system in typhus fever; any more than in measles, or hooping-cough. A peculiar cause has operated upon the body; and a peculiar state has been thereby induced; only the *effects* of which we can observe.

Notwithstanding this uncertainty, however, the *treatment* of fever is in the highest degree rational; and in the highest degree successful. We must aim, in the first place, at having free ventilation, and the most perfect cleanliness;—plenty of washing, plenty of clean linen, and plenty of fresh air. With fresh air and fresh water, we may go on very well; but if there be any smell, which ventilation and washing will not remove, the chlorides (I need not say) are excellent things. They should be sprinkled upon the bed, or upon the floor; disposed in saucers, or in rags dipped in the solutions, and hung on the backs of chairs about the room. A solution of the chloride of lime, ought to be put into the utensils which the patient employs; that no unpleasant smell may arise in the room;—no contamination. When you first see a patient, if he be dirty, before prescribing anything else, it is right to prescribe soap and water. Before anything else is done, I would always have a patient got perfectly clean. When he is well cleansed, with soap and water, all over his body; and especially his lower half, and his lower extremities,—a portion which is sometimes exceedingly filthy,—you should have him well washed with plain water, several times a-day. Soap is no longer required; but sponging, several times a-day, is always of importance. I believe it is always safe, in fever, to wash a patient with warm water; but if he say that he is hot, or if (when you place your hand upon him) you feel that he is hot, you may employ cold water.

If the temperature of the patient be steadily above 98°, as ascertained by a thermometer placed under the tongue, or placed in the axilla; if there be no pulmonic affection;—no general profuse sweat-

ing;—and the patient himself does not say that he is chilly;—you may take him out of bed, and throw a pail of cold water upon him. This, of course, is cold affusion; and may be repeated. The patient must be dried, and put to bed; and as soon as he grows hot again, the same measures may be adopted. This plan makes him exceedingly comfortable. Frequently it induces perspiration; and frequently it sends him to sleep; but even if it fail of this, it nevertheless makes him very comfortable, and sometimes cuts short the fever. Upon this subject you should read Dr. Currie's "Medical Reports."* But in general I do not find the heat steadily above 98°;—I do not find patients free from a certain degree of chilliness; and I therefore content myself with tepid or cold ablution. I have never had occasion for affusion; but it is always safe, under the restrictions I have laid down. The cold bath is too chilling a thing;—it would strike too suddenly. But when it would not be safe to take a patient out of bed, and throw cold water upon him, you may always have recourse to ablution, either cold or tepid. I always make it a rule to consult the patient's feelings on this point; and if I think he cannot bear much cold, I have him stripped, and sponged all over with tepid water; and between the intervals of this treatment, basins of cold water should be brought to the bed-side; and he should be allowed to put his hands into them as often as he thinks proper; and his face, too, should be continually washed. If there be any pulmonary affection, or if the patient say that he is chilly from the ablution, then you should use it tepid; for I need not say that tepid ablution is a great source of relief; and that it cools the patient considerably. It does not produce the impression that is made by cold water; but a great degree of evaporation takes place; and it extracts a certain portion of the patient's temperature. When it is applied, its temperature need not be 98°. From 80° to 90° is sufficient; and it cools the patient by its subsequent evaporation.

To co-operate with this treatment, the patient should have but few clothes upon him; and the windows and doors should be opened; so that he may have not only a free ventilation, but at the same time a cool temperature. The doors and windows should be wide open; unless the patient feels chilly, or the draught seems too strong for him. As the disease lasts longer, you must apply cold less. You will find that there is not the same power of generating heat;—that the patient is not so hot as before; and therefore the application of cold is less advisable; and you find it necessary to use *tepid* ablution, where previously you used *cold*. Indeed, as the disease advances, and the patient is getting better, there is little occasion for much abstraction of temperature. You find ablution, whether warm or cold, less and less frequently wanted; and you find a low temperature less and less required. But while, in general, ablution is employed for the purpose of *cooling*, it should still be partially employed for the purpose of *cleansing*. The hands, the feet, and the head, ought

* "Medical Reports on the Effects of Water, Cold and Warm, as a Remedy in Fever, and Febrile Diseases; by James Currie, M.D., F.R.S."

to be looked after. With regard to the temperature of the room, the same rule is to be observed as at the beginning; that is to say, the patient's feelings ought to be consulted. If he be delirious, of course you will not attend to him, but judge for yourself; but if he be not delirious, and say that the temperature of the room is unpleasantly cold, then you ought not so freely to diminish it.

While you thus attend to the surface of the body, you likewise have to attend to the inner surface;—to the alimentary canal. It is a good practice, in the beginning, to give an emetic; but if you find tenderness of the epigastrium,—if you find tenderness on making pressure on any part of the abdomen, I would not have recourse to any such measure. If, indeed, there should be a violent determination of blood to the head, I do not know that I should have recourse to it then. Frequently, however, in the beginning of fever, it is an excellent practice to give an emetic;—for instance, a grain of tartar emetic, with a scruple of ipecacuanha; but I should never think of giving it, without first ascertaining whether the abdomen was tender on pressure or not. Sydenham gives very good advice on this point. He advises us to premise bleeding, before we exhibit the emetic. This practice is not always necessary; but if the pulse were full, and there were great signs of a determination of blood to the head, I would bleed first. But whether we give emetics or not, there is no doubt of the propriety, in every case of fever, of seeing that the bowels are regularly opened;—that no filth collects in them, any more than on the surface. They should be freely opened, for the most part, every day; at least at the *beginning* of fever. If they be confined, one of the best things is a large dose of calomel. The quantity must vary from two to five, ten, fifteen, or twenty grains, according to circumstances; but for the most part, five grains of calomel, followed by castor-oil every two hours, will answer every purpose. Now and then you will have obstinate constipation. A patient may not have had a good stool for many days; and then you may give ten grains or a scruple of calomel, and follow it up by castor-oil; but it would be wrong to give a dose of that description, if there were every probability that a few grains would answer the purpose. Nothing is better than to follow it up with castor-oil; but at the same time, I need not say you are likely to accelerate its operation, by giving a common injection. This, however, is not to be done if the bowels be sufficiently open of themselves;—if they be open once a day. Sometimes it will happen that they are *too* open;—that there is the *opposite* state, that of excitement; and then, of course, purgatives would be highly improper. The purgative plan, when necessary, is of course to be put in practice at the *onset;* but, in regard to ablution, I have stated that I would continue it during the *progress* of the disease. Calomel certainly does clear out the disease better than any thing else; although it usually requires another purgative to set it off. But although you clear out the bowels well in the first instance, by means of calomel, you nevertheless often find it a good practice to go on with smaller doses of that

medicine, or other preparations of mercury, during the course of the disease. This will generally prove quite sufficient to keep the bowels open, without any thing in addition; but if from two to five grains, exhibited every eight, six, or four hours, do not effect that object, you must accelerate the action of the mercury, from time to time, either by an injection below, or by a moderate dose of castor oil. Senna and salts are given by some practitioners; but, upon the whole, I think castor-oil is best. Indeed, if the stomach or the intestines be irritable, we ought not to do more than give an injection. Accumulation and torpidity, however, do not always exist; for sometimes we have diarrhœa, and the whole of the abdomen is tender; and of course purgatives, under such a state, are likely to do more harm than good. It is right, before debility arises, to have one, two, or three stools a day; but, if they take place without medicine, and be of a watery character, it is necessary to restrain them, lest the patient should sink. As a general rule, where there is no irritation of the bowels, or much real debility, we ought to make a point of procuring two or three stools a day. There is no rule for the dose of calomel; but if you give mercury in small and repeated doses, it generally keeps the bowels in an open state; sometimes, indeed, more open than you wish.

The use of purgatives in fever is very great; but undoubtedly it has been exagerated by certain writers.* You will find, if you consult some books, that you have only to turn the patient inside out, in order to cure him; but I am quite certain that such is not the case. Within the last two or three years, there has been found a great disposition to diarrhœa, which it has been absolutely necessary to restrain; but no one can dispute the propriety of removing all filth, once or twice a day, from the alimentary canal. Costiveness ought never to be allowed; for it causes the tongue to be brown and dry; and, except in the last stage of fever, where there is frightful debility, you ought to have one stool in the twenty-four hours.

Small doses of mercury, with the rest of the treatment already mentioned, will enable you in the greater number of instances to get rid of fever;—such, at least, as I see. In other cases, however, it is necessary to be more active. It is necessary to take away blood; and you may do it either at the arm, or by what we call *local* means. Venesection is certainly not required for mere generally increased action. If no organ in particular be suffering;—if you cannot discover great excitement of any one organ;—if there be mere general excitement of the system; I do not believe that venesection is required. However, if you know that the epidemic is of such a character, that inflammation is sure to come on, it is as well to bleed in the arm; to prevent such inflammation, when it does come on, from being so violent as it otherwise would. But, as a general rule, in the fevers that I see in London, venesection is not demanded in one case out of thirty or forty. It would be wrong for me to speak of what people see in other places; because fevers differ

* See Dr. Hamilton's celebrated work on Purgative Medicines.

in different situations. In the country, where people are strong and plethoric, and in hot countries where the excitement is sometimes exceedingly great,—the congestion within the head, chest, or abdomen, very considerable,—the lancet is the "sheet-anchor;" whereas, in the majority of continued fevers which I see, venesection is certainly not necessary; and I am sure that those who employ it extensively in this disease, if they do not destroy their patients, yet protract their cases. However, you will find it of great importance to employ *local* bleeding; and, except in hot countries, I think every good may be obtained from it, in the majority of cases, without that shock which *general* bleeding produces; and which is very desirable in mere inflammation. In *fever*, this shock is not demanded. In comparatively *mild* fevers, it would make the disease severe; and in those of an asthenic character, it would knock the patient down.

It is necessary, in every case of fever, to be constantly on the look out for local inflammation;—every day to ascertain what is the state of the head, the chest, and the abdomen. You should always ask if the patient complains of headache. You should look at his eyes; and see whether they are red or not. Ascertain if his pulse is full; and inquire whether there is any throbbing of the head. So, with respect to the chest, you should observe whether there is difficulty of breathing; and if there be, it is well to apply the stethoscope, and ascertain what rattling there is. The abdomen ought to be carefully felt every day; to see whether the stomach, intestines, liver, peritoneum, or other parts, be inflamed. When we find a sufficient degree of inflammatory disturbance of these parts, then it is right to take away blood locally. If the head be affected, then you should cup at the back of that organ; or apply leeches to the forehead, temples, or behind the ears; but if it be the abdomen which is affected, it is always better to employ leeches. If the pain be situated at the front of the head, it is better to employ leeches there. I mentioned, when speaking of inflammation, that the effect of leeches or cupping is often very local. I have seen parts, where they were applied, relieved; while others, in the neighbourhood, remained as painful as before. At whatever part of the head the pain is felt, there you should direct your means of treatment. If there be delirium, and this delirium be accompanied by pain and heat of the head, or throbbing; or if the eyes be red; or if there be great vivacity, like incipient delirium of an active kind; you ought always to shave the head, then apply a cold wash, or employ a bladder of ice (which is one of the best things), and put plenty of leeches on, or employ cupping at the occiput. If there be vomiting, or tenderness at the epigastrium without it, you should apply leeches, which are the best remedy for it; for, when there is tenderness or vomiting, it generally arises from inflammation of the mucous membrane; and leeches will remove it, by removing the causes of inflammation. So, with regard to the abdomen at large, when that is tender, there is generally more or less diarrhœa; the intestines are acting too violently; and leeches freely applied, are the best mode

of restraining it. After they have been applied, you may employ a blister; but you should always remember, that a blister will not take the place of local bleeding, if the inflammation be considerable. If there be local inflammation, you will frequently find that the application of leeches will remove it; and after it has greatly subsided, slight inflammation, or mere irritation, may be left; and you may find a blister of the greatest use. We shall see, when I come to speak of diarrhœa, that leeches and blisters are frequently the best remedy for it.

After a proper detraction of blood, or in a case where the loss of blood is not advisable, blisters applied to the nape of the neck, to the forehead, and also behind the ears, are very useful. A blister applied to the summit of the head, is generally a painful thing; and I would not have recourse to it, except as a last measure. Before the inflammatory state has much subsided, and before there is really more of irritation than of inflammation, the application of blisters would of course be doubtful almost any where; but particularly at the top of the head. The hazard, however, would certainly be far less, if they were applied to the nape of the neck, to the occiput, and to the forehead. I need not say that leeches must be repeated at intervals, as long as the local symptoms seem to demand them, on the one hand; and the strength of the patient will bear them, on the other. When, however, notwithstanding local inflammation or irritation, you do not wish to apply even leeches or blisters, mustard poultices are particularly useful. When applied over the epigastrium, they will stop vomiting. They are very serviceable over the abdomen; and by many persons they are employed at last, or even in an early stage, to the feet; with the view of exciting distant irritation.

You will find, in many of these fevers, that it is of the greatest use, to give mercury; especially if there be a degree of inflammation, and great foulness of the tongue. If you give it in small, but repeated doses, it will answer the purposes that I formerly mentioned. It not only purges the patient; but by degrees it causes the tongue and the interior of the mouth to become moist; and when that is effected, the patient is almost sure to be better. It is necessary to remember that it should not take the place of local bleeding. It will increase the good effect of detraction of blood; and where that is not required, it will do alone; but where that is necessary, mercury must not take its place. It must be used as an auxiliary to bleeding; and not as a substitute for it. Over and over again, in treating patients, I have omitted the mercury; and have seen the tongue grow darker and fouler; and then, upon having recourse to it again, I have seen the mouth resume its moisture, and the tongue become less foul. I have made the observation too often to doubt its accuracy. It is true there are many cases of fever, that will do without mercury. I only say that, in the mass of cases where mercury is given, the success is greater than when it is omitted. We cannot draw any argument from a single case; it is only from a series of cases, treated in a particular way, that we can arrive at any legitimate deductions; and as

far as I have seen, the moment the mouth becomes moist,—provided proper detraction of blood be instituted, and all other suitable means,—the local symptoms of inflammation generally decline; and patients recover more quickly than they otherwise would; and many recover who, in all probability, would not, unless that practice were resorted to. Still, I must again repeat that a great number of cases of fever will do well without it; but where the symptoms are severe, you will find it a most useful medicine. You should not aim at any violent affection of the mouth; and if that should occur, the medicine must be omitted till the symptoms remit; but you should feel the patient's gums every day, to ascertain whether the mercurial effect is kept up. There can be no doubt that mercury will sometimes take effect, not in consequence of having cured the disease, but by the disease becoming better, (through nature and the general means employed), and the mercury being no longer resisted. The proof of mercury doing good, consists in this fact;—that if you give it quickly to get the mouth sore, the sooner that object is effected, the sooner in general is the patient improved.

You will find, however, that calomel is frequently too active for the intestines; and blue pill, or Hydrargyrum cum Cretâ, answers better. After a time, even these will purge; so that it is necessary, along with them, to exhibit chalk mixture, or an infusion of catechu. It is well to give the infusion of catechu or kino, for it will enable the patient to bear the mercury; and you frequently find that Hydrargyrum cum Cretâ is the only mercurial preparation that can be borne. Mercury, if pushed too far, increases the mischief; it induces great irritation of the alimentary canal. Every *good* remedy of course requires to be *properly* used. Small doses of opium, I need not say, will tend to check the diarrhœa; and frequently there can be no objection to five drops of the tincture, three or four times a-day.

As to antimony, I do not think it an appropriate medicine; for it irritates the stomach;—a circumstance which you do not want in fever. There is so frequently also a disposition to sickness, that it is very likely to excite vomiting. If you give mercury at the same time, the antimony has a great tendency to counteract its effect. It may cause the mercury to be rejected; and, I confess, I have never seen any material good done by it. In cases of decided inflammation it would be a good remedy, pushed to a large quantity; but when the case is attended with great irritation of the alimentary canal, (as many attacks of fever are), and the patient has but little strength, I am sure that it is better not to give antimony; lest you make the patient's stomach so irritable, that it will not bear food, or anything else. It is only where there are very decided marks of inflammation, that it might be given; and then I should approve of mercury, infinitely more. As to its sudorific effects, I have given antimonial wine in very large doses, without producing sweating. The best mode to ensure sweating in fever, is to clear out the bowels, to reduce the temperature of the surface, and to take away

blood locally or generally, accordingly as it may be required. I have seen patients lying in a carpetted room; with the windows shut, plenty of bed-clothes on, and perhaps a fire in the room into the bargain;—and all this, I have been told, was to excite "a gentle diaphoresis!" The diaphoresis, however, never made its appearance; but by opening the windows, putting out the fire, removing the bed-clothes, taking up the carpet, purging the patient well, and removing any local inflammation that was present, it has come on immediately. The idea of a few grains of antimonial powder, or a fraction of a grain of tartar emetic, once or twice a day, being important in fever, appears to me quite absurd. With the treatment I have mentioned, nothing else will be required, till great prostration of strength sets in.

All cool drinks are of course proper; and a saline draught is as good as anything which can be given for a drink. People will frequently take from half a pint to a pint a day. It is always to be remembered, however, that all acid matters, and even a saline draught, have a tendency to increase any irritation that may be present in the bowels; and diarrhœa is frequently kept up, by a saline draught being continued. But if there be no purging,—if the alimentary canal be tranquil, acidulated drinks are very useful. Upon the whole, however, a downright cool drink,—plenty of cold water, is one of the best things that can be given.

As the symptoms all decline, all the remedies must be diminished, both as to force and to frequency; and there may be less abstemiousness practised. Nourishment may be gradually given; and one of the best articles, after slops are done with, is milk. It is very wrong to continue starving a patient after fever is gone. You will find, when the fever is over, that the appetite becomes remarkably keen;—keen in a degree that is never witnessed after any other acute disease. Patients, when the fever is over, are sure to say that they are very, *very* hungry. Other patients will ask you for full diet; but patients after fever ask from their very hearts. They seem to have a craving which impels them to ask you, whether they think you will be offended or not. You find patients more emaciated after fever, than after any other acute disease. Even when no evacuations have been practised by the medical attendant, and when the disease itself has not been attended by any great evacuations, you will still have a degree of emaciation, which I think you will not witness after any other disease; and when the fever is over, and there is such a craving for food, it would be contrary to common sense to withhold it. It seems to be a real call of nature;—it seems that food is absolutely demanded. I always make a point of giving them light animal food;—not pork or veal, or artificial trash; but plain mutton, and good fresh beef; and carefully watching the effect.

Suppose, however, that the disease does not run on in this mild form; or that the inflammation does not become subdued, as in any inflammatory disease; but that signs of great debility come on; we must then have recourse, even in the midst of fever, to good support.

Milk should be given, in as great abundance as the patient can take it; and, I think, strong beef-tea. Some imagine that, the digestive process being suspended in fever, animal broths cannot be digested; but, however that may be, I know that persons who take strong beef-tea, frequently do admirably well. By "strong beef-tea," I mean a pound of meat, chopped extremely small, and boiled in a quart of water, until the latter is reduced to a pint. Some persons will take two or three pints of it in a day; while some require only one pint;—and you find them considerably nourished by it. Many persons cannot take milk; but where it can be borne, it is excellent nourishment. I need not say that arrow-root, sago, and rice, may be taken with the milk. I believe that, occasionally, you will find that you must give more nourishment than you can get down by the mouth; and when there is extreme prostration, it is useful to give strong clysters of beef-tea, in which an egg may be diffused. I have seen them given to a patient every four hours; apparently with the result of getting him through the disease. If the clysters be discharged again, and not retained sufficiently long to be beneficial, you will find it useful to put into each of the injections a drachm, or two drachms, of powdered catechu.

More than all this, however, is sometimes required; and we must give a patient wine. If you give wine, as a *general* remedy for fever, I am certain that you will kill one half your patients; but if you give it in the latter stages of the affection; or if from the first, the disease be attended with great debility, you will frequently do much good by its exhibition. It is often indispensably necessary, but not (so far as I have seen) at the *beginning* of fever. A great number of cases do well without it altogether; but I have seen cases, over and over again, where a glass or two of wine has stopped vomiting or diarrhœa. It is where there is extreme debility,—where there is *irritation* rather than *inflammation;* and where you find that the pulse is feeble,—almost fluttering; and, by the look of the patient, you see that he is sinking;—it is here that I have found it beneficial. I have always been accustomed to quote Sir John Pringle on the exhibition of wine; because I think that his directions, both as to the quantity required, and the time at which it is to be given, are the best which have been written. He says, "In our malignant fever," (he was physician to the army) "when the pulse sunk, it always became very frequent" (that is generally observed); "and in proportion as it rose with the wine, it turned slower. I have also had experience of the good effects of wine, when the tongue has been both foul and dry." Here is an illustration of the propriety of not attending to one symptom, but to the whole. A dry and foul tongue frequently indicates inflammation; but if you find no inflammation present;—on the contrary, great prostration of strength, with a fluttering pulse, an anxious countenance, and inability of the patient to move himself, then you need not fear foulness and dryness of the tongue; but may exhibit wine. "When wine is given," Sir John Pringle says, "in proportion as the patient grows

stronger, the pulse becomes slower. Wine, in health, will *accelerate* the pulse ; but when a person is weak, and the pulse is quick in proportion to the weakness, and when this state does not arise from inflammation, but downright exhaustion, wine, instead of *quickening* the pulse, makes it *slower*. "The surest indication for wine," continues Sir J. Pringle, "is taken from the long continuance of the disease; the languor, and dejection of strength; and the slowness and faintness of the voice; but we can never be absolutely certain of its effects till we try it." This is also a point carfully to be attended to. You constantly meet with cases, where you are in doubt as to the proper mode of treatment to be adopted. This occurs to me every day; and will occur as long as I live. You are not certain whether the time has arrived, at which you are to treat the case as inflammatory or not; and one is often made unhappy by this circumstance. Whenever a suspicion of this sort arises, it is best to combine both modes of treatment;—to lessen any excitement; and to begin stimulating and tonic remedies, with great caution. Whichever you find do good, you must increase; and, in fact, substitute it for the other plan. "I have seen," Sir John Pringle says, "in cases of this kind, strange instances of the power of instinct; for when wine was to do good, the sick swallowed it greedily, and asked for more; but when it was to heat them, or raise the delirium, they shewed an indifference, or even an aversion to it." It is of the greatest importance in fever, to attend to the wishes of the patient, provided he be not delirious; for then he will talk at random. But if he be not delirious, or only partially so;—if he be sufficiently collected to know his own feelings, and to give a clear account of those feelings, they should, in general, be attended to. "Sometimes," he then continues, "the physician can have no better measure for the quantity requisite, than the appetite of his patient."

Half a pint of wine is sometimes required in twenty-four hours; —one glass being given at a time. Generally a pint is the utmost that is requisite; though I have given a bottle with advantage. It is best not to give Rhenish wines, or thin claret, or any acidulated wine; for, if diarrhœa be present, it will increase the irritation of the alimentary canal. It is also best not to give sweet wines; for they are apt to ferment and become acid in the stomach. Sherry, Madeira, and port, are the best that can be employed. If there be no irritation of the alimentary canal, but a torpid state of it, acidulous wines may sometimes, perhaps, be admissible. If the patient desire porter, or has been accustomed to it, you will find that very good; but you should not give a pint of porter at once. A wine-glass or two may be given every few hours; or perhaps only once in the twenty-four hours. Because a person desires porter, you are not necessarily to give a pint in the twenty-four hours. When there is mild delirium (not delirium *ferox*, but a *muttering* delirium), or when the pulse is rapid and weak, and when extreme debility has come on, then it is right to resort to this treatment; for it will frequently stop the delirium, or, at any rate, check

it. But if you go on with it after it has stopped the delirium, it will frequently bring it back; so that the patient is worse than he was before.

In this state of debility, many give ammonia and ether; but I cannot help thinking that wine, or good malt liquor, is the best article that can be exhibited; unless the malt liquor bring on diarrhœa. It is much better to give those stimulants which most people like, than to give ammonia or ether. The former are *natural* stimulants; and are much more grateful to the patient. Care must be taken, with all these things not to overload the stomach. The moment you find the head affected by them, or the stomach overloaded, it may be necessary to give an emetic. For the same reasons that I have already stated, I should also prefer giving wine, to giving what are called *vegetable* stimuli;—such as serpentaria. It is true I know nothing about them. I dare say they are good; but I have always been able to do without them.

Dr. Stevens says that, in this state of debility, he has seen great benefit arise,—far greater benefit than from anything else,—from very small and repeated doses of the carbonate of soda, nitre, muriate of soda, or oxymuriate of potass; which supply the deficiency of saline particles in the blood. He has a vast collection of testimonies in favour of the saline treatment in yellow fever; where, after a certain period, ordinary treatment generally does more harm than good. In all such fevers, he contends that, in the first instance, it is the best practice to bleed the patient and give mercury; but after a certain period has arrived, the blood falls into the condition I formerly stated; and that condition is made worse by mercury; and, of course, by bleeding; but he says it is admirably remedied by small doses of neutral salts, particularly those I have mentioned. Twenty or thirty grains are given every three or four hours; except of the oxymuriate of potass; of which about a third of this quantity is a dose. It appears that those who have adopted this plan, in the West Indies, have had the greatest success. He informed me that, in yellow fever, many had agreed that they did their patients altogether more harm than good by treatment; and that those succeeded best, who gave nothing but saline draughts, in a large quantity. Neutral salts are now given, in the large doses I have stated, and with the very best effect. By adding neutral salts to blood, however black it may be, you make it of the brightest scarlet; but if you add acids or alkalies to red blood, you make it black.

As to tonics, by far the best is quinine. If you judge it right to attempt supporting the patient by means of quinine, it should be given, in doses of three or four grains, every three or four hours. I certainly fancy that I have saved patients in the last stage, when there has been no longer room for giving mercury, by supporting them well with good nourishment and wine, and by giving sulphate of quinine in considerable doses. But you must remember that, in giving sulphate of quinine as a tonic, it may do harm by purging; and therefore you should be on your guard against this, by admi-

nistering astringents at the same time. I frequently accompany it by catechu; and then the irritation is generally put a stop to.

In the last stage of fever, some give opium in small doses, for the purpose of keeping up excitement. Dr. Wall, of Oxford, and Sir John Pringle, did so; but others give a dose once in the twenty-four hours, for the purpose of tranquillizing the system. I have no great experience of it as a stimulant; but I know that, when a patient has long laboured under fever, it is quite safe to give him a dose of this kind, in order to procure him a good night's rest. I suspect that wine is a better stimulant than opium; although opium is certainly exceedingly useful in the latter stages of the complaint. Some highly praise musk. I need not say that morphia is sometimes greatly adulterated. It is said that opium is not always of a certain strength, and that morphia is; but from being adulterated, morphia is of the same uncertain strength as opium. Opium is particularly useful in procuring sleep; and in putting a stop to vomiting and purging. The muriate of morphia is an admirable form of opium, if not the best.

The treatment of fever consists in subduing inflammation, on the one hand; or in supporting the strength, on the other; and you must always carefully look out for local symptoms, and check them. The vomiting is frequently urgent, and very distressing to the patient; and although effervescing draughts will sometimes stop it, as will also hydrocyanic acid, yet if there be inflammation present, it is not in the nature of these remedies to arrest it; and you must then employ leeches, blisters, or sinapisms. So with regard to purging, opium will frequently put an end to it, and so will all astringents; but, as I have before said, it is best not to give astringents if there be inflammation present. Leeches and blisters will then effectually subdue it, when nothing else will. If the fæces be exceedingly fetid, you will find it very useful to give yeast, either by the mouth, or in the way of injection. An injection of yeast will frequently very much correct the offensive odour. Some give it in porter. The injection of the chlorides would, I fancy, be useful; but I have no experience of it. In fever it is necessary, every day, to attend to the state of the bladder. It frequently happens, in this disease, that a great accumulation takes place in the bladder; and patients might go three or four days without making water. Great inconvenience may, at last, arise from this source; and therefore it is a point that should be carefully looked after every day.

There is only one other circumstance that it is necessary to attend to; and that is the longings of the patient, during the progress of the disease and afterwards. These should be indulged, unless there be some very good reason against it. You see, therefore, that the treatment of fever bears an analogy to the symptoms. You saw that the symptoms of fever varied, from those of the most violent inflammation,—the most violent excitement of the system, on the one hand, down to extreme prostration of strength on the other; and the treatment must vary in like manner. It may be requisite that the

treatment should be of the most active anti-inflammatory kind, on the one hand; or the most gentle anti-inflammatory treatment, with a moderate support of the system, on the other; or it may even require to be of the most supporting and stimulating kind. Fever is not to be treated because it is *fever;* but according to the circumstances of each particular case. If you have twenty cases of fever, you are likely to find them more or less different from each other; and requiring more or less difference of treatment, according to the urgency of the symptoms. You will therefore remember that, in fever, you have to vary the treatment; from that of an active inflammation, to that which you employ in mortification, when the mortification is attended by inflammation.

REMITTENT FEVER.

I now enter upon the subject of *remittent* fever; which resembles both *intermittent* and *continued* fever; and partakes of the character of each. Essentially it is the same as *intermittent* fever. It arises, I believe, from the same cause,—malaria; but either through a modification of the malaria, or the influence of such causes as predispose to, or excite, *continued* fever, we have only remissions;—not *intermissions*, but *remissions*. The disease is really *continued*, although *remitting;*—having a relaxation of severity at different hours. This disease occurs in hot climates particularly; and in cold climates during hot seasons. It therefore occurs when and where there is the greatest abundance of vegetable matter; and where there are all the circumstances most favourable for decomposition, and the production of *aguish* fevers; and, also, where there is the greatest prevalence of those causes, which are likely to excite *continued* fever;—excitement and relaxation of the body, and disturbance chiefly of the abdominal organs. Many epidemics described, in ancient books, as plagues and pestilences, were really remittent fevers.

When remittent fever is acute, it seldom, I believe, lasts more than six weeks. There is continual fever, day and night, and every day; but the patient is much less hot at one time, than at another; so that, although he has constant feverishness, he feels himself far less ill at different intervals. Sometimes, in addition to the continual fever, there is a regular paroxysm of ague. I have seen a person constantly hot day and night; except, perhaps, every *other* day; when he had a cold fit; and then the heat would become more intense, and sweating would occur. But when the latter was over, there was no intermission; for the patient was hot again. The usual form is continued feverishness; with a great aggravation of it at particular periods. Or (if you choose to put it in another way) we have the symptoms of continued fever; but a relaxation of these symptoms at particular periods. But besides this, (although I do not recollect its being described), I have seen continual fever, with a paroxysm of ague coming on, at regular intervals, in the midst of it.

Sometimes instead of remissions, alternating with an aggravation

of the feverish symptoms, you will have the remittent nature of this continual fever shewn only by occasional chilliness. I have frequently discovered that *continued* fever (as it appeared to be) was really *remittent* fever, by noticing that, although there was continual feverishness, heat, and thirst, yet the patient in the midst of it was frequently chilly; and on other occasions by observing that, in the very midst of the heat, there was from time to time profuse perspiration. The nature of the disease was pointed out to me, either by the occurrence of chilliness (even amounting to rigors) from time to time; or by the occurrence of sweating at intervals. The correctness of this opinion has been proved, by giving the patient quinine; which has restored him to health. I think, so far as my own observation goes, that remittent fever shews itself sometimes in these two forms. Intermittent fever will become *remittent*, if the cause of *continued* fever be superadded, after *intermittent* fever has began. Supposing a patient has ague, and goes through great fatigue or want of rest, or is exposed to wet or cold, he may be thrown into continued fever. These circumstances alone would not cause ague; but as ague already exists, the disease becomes remittent fever. The causes of *continued* fever, are applied to a constitution labouring under *intermittent* fever; and then you have *remittent* fever. Frequently, however, the disease is produced from the very first.

Dr. Maculloch imagines that remittent fever is often a chronic affection; that it is often mistaken for hypochondriasis; and that the paroxysms are not observed, because they occur in the night. I am persuaded he is correct. I am persuaded that many persons have long-continued remittent fever;—frequently for many, many months; and, its true nature not being detected, it is thought to be some indescribable complaint. I have now under my care a patient who appears to be in this state;—a man who is frequently very hot; complains of heaviness in the head; is affected in his mind; and has great depression of spirits. This man was taking five grains of sulphate of quinine, three times a-day, without any effect; but on increasing the dose to *ten* grains, I found him better. I have seen many such cases; and they long puzzled me. They are principally characterized by oppression of the head, heat occasionally in the night, and great depression of spirits.

The acute disease frequently occurs in a dreadfully violent form; and a form as dreadful for rapidity as violence. It is in hot climates particularly that this occurs. This form of the disease is so violent, and so acute, that there is at first delirium and violent vomiting; with an absolutely roasting heat in the stomach; and great pain, tenderness, and agonizing distress, at the epigastrium. Besides these local symptoms of the head and the stomach, there are all the signs of a violent inflammatory fever; and these symptoms, both local and general, are soon followed by the most awful debility, and by all the signs of typhus.

The fever of the East Indies is a violent and acute remittent fever; accompanied by great derangement of the liver and stomach; and

occurs in various other parts of the East besides Bengal. At Bengal it arises from the overflowing of the Ganges, and the subsequent fall of the waters, acted on by a high temperature. After the Ganges has overflowed, the waters fall in November and December; and in consequence of the heat, such emanations are produced as to cause this fever. The violent delirium, pain, and vomiting are succeeded, after a certain time, by a remission and a sweat. This occurs about twelve or fourteen hours after the attack; and the pulse from being 130, may fall down to 90; and then the delirium ceases, and the mind is restored. The remission, however, is but short; for the symptoms soon reappear; and are then succeeded by the awful debility to which I have referred. If the disease prove fatal, there is very soon no remission at all. The gastric symptoms become more violent than before; the tongue becomes black; the pulse small; and the patient sinks. If it be fatal, it generally proves so (we are told) between the third and the seventh day; but occasionally it has been known to last fifteen, or even twenty days. Of course, I am only speaking from information which I have derived from authors. This disease has appeared, with some other symptoms, in the Mediterranean, in North America, and in the West Indies. In the Mediterranean it has appeared at Rochfort, Bourdeaux, Lisbon, Gibraltar, and Minorca. In addition to the symptoms I have already enumerated, the fever is characterized, in these countries, by yellowness of the skin, and a vomiting of black matter. Thus varied, it has been called *yellow fever*, from the yellowness of the skin. In America it is said that thirty-six, or even seventy-two hours, generally elapse before the remission takes place.

The black vomit, which is as much characteristic of yellow fever as the yellowness of the skin, is thought to be bile a little changed from blood;—imperfectly formed bile; or even blood only a little changed. Indeed, some suppose that, of the two, it would be more proper to call it *blood* than *bile*. Indeed, it is said that it has been found on the surface of the stomach, when there was none in the duodenum;—as though it had come from the liver. This black vomit is said to be by no means acrid. Dr. Physic, of America, says it is tasteless; and that he dropped some into his eye, and the organ did not become irritated. He also says that he found an abundance of it in the stomach, when a different fluid was observed by him, both in the gall-bladder and the gall-ducts. It is decidedly of the appearance of charred blood;—of blood that has undergone certain changes, and is poured forth from a mucous membrane. Another gentleman has carried his experiments, with the black vomit, farther. Dr. Firth tells us that he procured two ounces from a patient (whether dead or alive I do not know); that he drank it undiluted; and found it harmless. Before this he had drunk a large draught of it, mixed with water, with impunity; but he took two ounces in its genuine state; and said he was none the worse for it. He wished to try it in a solid form; and therefore made an extract into pills; and he says that he found as little inconvenience from them, as he had previously

done from his black draughts. The fluid and concretion of melanosis, also is generally inert.

With regard to the yellowness of the skin, it is ascribed by some to bile pervading the system; but there are very great doubts as to whether that is its origin. The bile is very abundant in this disease; and may be regurgitated, by violent vomiting, into the veins, through the compression of the parts; and, indeed, bile is abundant in the urine. There is a great collection of bile in this disease; and it may find its way into the veins, and more or less will go into the circulation; but there is no obstruction. At any rate, it is certain that, if it be bile, it is not obstruction that produces regurgitation of it; for the fæces are well tinged with bile. One reason for saying that it is not bile, is that it will occur in patches. It is not more visible in the eyes and nails, than in other parts of the body; and it is not diffused pretty equally throughout the body, as we observe in jaundice; but occurs in patches, as ecchymoses would do. It would appear rather to owe its origin to the blood being changed;—to the serum, with a few red particles, escaping more or less into the cellular membrane;—the blood having undergone a change. It is altogether analogous to ecchymosis, when nearly gone; and we know that an ecchymosis does not arise from bile; but from an effusion of blood, that is subsequently in a great measure absorbed;—the portion which remains giving a yellow colour. Sir Gilbert Blane says, that this yellowness has spread from bed to bed without any increase of the malignity of the disease;—that when yellow fever has prevailed in the West Indies, he has observed it spread from bed to bed; and that it bore no proportion to the malignity of the disease. It appeared in two vessels (the Alcides and the Royal Oak), when there was only a slight indisposition. He also says that, unlike jaundice, it begins usually about the parotids. There is usually fulness and flushing of the face and neck; but particularly about the parotids. Here there is the most blood; and here it is that the yellowness appears in the most distinct manner.

This yellow fever (or *causos icterodes*, as some call it) is apparently another form of bilious remittent fever; and occurs only in countries and in seasons, where the heat is such as would destroy or arrest the plague. It occurs, too, in hot seasons; such as would usually put an end to contagious typhus fever; when that is prevailing. Yellow fever, or bilious remittent fever, are always extinguished by cold weather. As soon as the cold sets in, they cease. It is said that the blacks, in America, are usually less violently affected than the whites; but that if they go into a cold country, and reside there for a time, and then return to America, they suffer equally with the whites. Persons who are unaccustomed to a high temperature, it appears suffer the most from this disease. Blacks coming from hot countries, or having descended from parents born in hot climates, suffer less; but if they reside in cold climates, their constitution partakes in some degree of that of the white; and then they suffer far more than others of their black brethren.

Cold countries, and the cold seasons of hot climates, are free from this disease. It generally occurs only in the tropics, and elsewhere when the heat is as high as in the torrid zone; but very intense heat, in cold climates, has been known to occasion it. If the temperature have accidentally been as high as in a hot country, then even a cold climate has been subject to it. Sir John Pringle, for example, says that he has sometimes seen yellowness of the skin in Flanders. Dr. Brocklesby mentions seeing it, in 1758, in the Isle of Wight. Dr. Home saw it at Worms, in Germany, in 1743. All those places which are subject to it, have a quantity of dead vegetable matter, in a wet and stagnant state. It prevails in the West India Islands, in Charlestown, Norfolk, Providence, Philadelphia, New York, Baltimore, and Boston. Those places that have the largest quantity of vegetable matter for decomposition, when the hot weather comes, and have the most moisture, are most subject to this yellow fever. It occurred at Lisbon till the earthquake happened. It occurs also at Cadiz, Bourdeaux, Rochefort, Seville, and Gibraltar. The latter place is situated high enough; but although high in reference to the sea, the town is low in reference to the mountains. The rain that runs off four thousand acres, it is said, streams towards the town; bringing with it a quantity of vegetable matter from the hills, as well as fragments of vegetable refuse from the markets. Even straw has been said to afford the source of this disease at Gibraltar. Sir John Pringle says that the straw was very injurious to the army there. The rocky soil increases the mischief, as it causes the water to remain.

However, notwithstanding it would appear that yellow fever is the product of malaria, there has been a difference of opinion, on this subject entertained at different times. A Mr. Vines, a planter and "physicker" in the West Indies in 1647, writing from Barbadoes, ascribes the yellow fever to "the Lord's heavy wrath;" and not to any thing in the climate. The island was not cleared for a considerable time after he wrote. The disease prevailed then, to a greater extent than it does now. A Spanish officer named Armesta, who ascribed the disease to local situation and atmospheric causes, was actually at one time arrested; and was obliged to retract his views, as being "false, dangerous, and seditious opinions." So violent, at one time, was the opinion that it had nothing to do with local situation, that fifteen hundred copies of this officer's book were burned. In the year 1800, the government had a different opinion; and ascribed it to something in the atmosphere. And this is really the case; for it is owing to miasmata.

A great question has arisen in the western hemisphere, and in the Mediterranean, as to whether yellow fever is contagious or not. Dr. Ffirth, of Philadelphia, who has tasted the black vomit in the way I have stated, says that he has frequently inoculated himself with it, and also with the serum, saliva, &c. of patients labouring under yellow fever; but that no prejudicial effect was produced. It is said that it is never propagated a mile from Philadelphia; and that there-

fore it must owe its origin to local causes. Dr. Rush, who was a celebrated American physician, and a violent contagionist, contended that this was a contagious disease. He afterwards retracted his opinions; and begs the forgiveness of the friends of science and humanity, if the publication of his former opinions had had the effect of increasing the miseries attendant upon the disease; and he says, indeed, that such is the pain he feels in recollecting that he ever entertained or propagated the opinion of its being contagious, that it will always lie heavy at his heart; and deprive him of the pleasure that he might otherwise have derived, from a review of his attempts to fulfil the duties of his public station. He says he was misled by Dr. Lining, and other writers. "I am aware," he says, "of the influence which changes in opinion have upon a medical man's reputation; but still I would cheerfully make a sacrifice of that kind, could it avert the evils which are connected with the belief of its being a contagious disease." The mode in which a false belief in contagion does harm, is by preventing the healthy from attending upon the sick; by stopping commercial intercourse; and by allowing the patients to remain in the unhealthy spot, which really causes the disease.

It is impossible for us who live here, to know any thing about these matters; for there is as much evidence on the one side, as on the other. In the East Indies it is never thought to be contagious; but in the West Indies it is to be so considered, by a large number of persons. The fever in Gibraltar gives rise to a diversity of opinion; and there are as many protestations as to its being contagious, as there are as to its arising from malaria. Dr. Stevens thinks that he has discovered the reason of all these discrepancies of opinion. He says there are three distinct yellow fevers in the western hemisphere. In the first place, there is one in which there is no contagion at all; but is a climate fever; and arises simply from excessive heat. It occurs to new comers, who are operated upon violently by the intensity of the temperature. Severe bilious symptoms arise; but he says there is nothing contagious in it. He contends, next, that there is the remittent fever; the *yellow* fever; arising from the local cause of malaria and heat together; a fever which is seen by every body, and acknowledged to exist by most. Besides these, he says there is a yellow *typhus* fever; which he has been able to trace to the negroes in America, who have come from Africa. It is a contagious disease, attended with yellowness of the skin, and brought there by the Africans. He says that all these three fevers are attended with yellowness of the skin. What his observations are, or how numerous they may be, from which he has drawn these conclusions, I cannot tell. He says that the symptoms of these fevers are all different at first; but that after a time they are all the same; and that although the general treatment of the whole is the same, yet that (as they differ in their minutiæ) they require a modification of treatment. I cannot say more upon this subject. I give no opinion upon it; but I should think it likely to be the case;—that there are two or three

different kinds of fever; and that the intensity of the heat occasions them *all* to be characterised by great yellowness of the skin, *some* by a depraved state of the blood poured forth under the skin, and *others* by jaundice. I have no doubt that Dr. Stevens's facts will be numerous; and that many of his opinions will be found well established. I believe that the greatest authorities in America are satisfied that the yellow fever (as it prevails there) is, for the most part, not contagious; but that it is *sometimes* contagious, appears very certain.

In a conversation which I had with Dr. Stevens, he mentioned an instance of yellow fever occurring in a family, situated at a great distance (across the sea) from any place where the disease had prevailed. The captain of a vessel was in a port, where yellow fever prevailed; and being continually among the people, his clothes and his linen were impregnated with it. I am not sure whether he had the disease himself; but he had been in the midst of those who laboured under it. When he left the port he cheated the quarantine; and went, with his linen unwashed, to another place, where no fever had prevailed. According to the quarantine regulations, his linen should have been washed; but I understand that, under those regulations, washing is very dear; and that every thing is charged double. He, therefore, to save this double expense, contrived to take some of his dirty linen with him;—satisfied that the disease was not contagious. The linen was taken out by his family, in this place where yellow fever had not prevailed; and, in a very short time, one and another of the sisters and maids who washed it for the captain, died; and an old woman, who lived in another part of the country, and came to help them, was also seized with the disease. It spread from house to house, all through the town; and produced very great devastation. Dr. Stevens says, that he knows it was the contagious form; that, in fact, it was what he calls *African typhus.* He took a voyage for the purpose of inquiring into the circumstances. The sisters said that it arose from the dirty linen; and it appears that he was able to trace it with the greatest accuracy. He also mentioned his opinion that *cholera* is contagious; but he is satisfied that the contagion is not efficient *at first.* He says you may be exposed to a person labouring under African typhus (as he calls it), or to a person labouring under cholera, without any fear of catching it, while you are in his *first emanations*; but that if you be exposed to these emanations, after they have passed from him many days, then you stand a chance of getting the disease. He considers that what proceeds from the body is not, at first, efficient;—that it is not a perfect poison when it is first produced; but that it undergoes a change, which enables it to produce the disease. He reasons in this way. Many persons who have visited cholera patients, have escaped; but they have suffered as soon as they have been exposed to fomites, in which the secretion was contained. How that may be, I do not know. He also says that he has ascertained another circumstance;—that, before the disease breaks out, the blood will

shew the disease. He says that this may also be remarked in scarlet fever. A medical man, finding that he was ill, was bled. The blood was shewn to Dr. Stevens; who found that it would not turn red with the usual neutral salts. He stated that he was satisfied the gentleman was about to have a contagious disease; and, in three or four days after this, scarlet fever occurred. He says that he has seen yellow fever in the blood, before the disease appeared; and that, in all instances where the disease subsequently appeared, he found the blood was of such a character, that it would not redden on the application of a mixture of neutral salts. Of course, all these things are exceedingly crude at present; but it is the opinion of many eminent chemists, that we are upon the eve of some important discoveries, with regard to the nature of all these matters;—that, by the treatment which Dr. Stevens has recommended, great light will be thrown on the pathological changes, which take place in the various fluids of the system; and on the nature of many diseases. I feel satisfied with the truth of much that has been said; and I feel satisfied that a strong and new light will be thrown upon a number of these matters, respecting which we are all at present in the dark. The latent period of this yellow fever, is thought to be from two to ten days.

With regard to the treatment, the best writers agree that, in the first instance, there should be copious venesection. Whether it be the fever of the western hemisphere, or the mere bilious remittent of the east, cold effusion, or cold *ablution*, is always serviceable. Great attention should be paid to any local inflammation that may occur; and local bleeding may be demanded. As to emetics, they cannot be employed if there be any tenderness of the epigastrium on pressure. Mercury is found useful in the first instance; but not afterwards. When you have symptoms of violent inflammation, it is very useful; but still a person may die with his mouth sore, if it be given too late, or a proper degree of bleeding is not practised. Of course moderate purging is necessary; but as soon as the remission occurs, sulphate of quinine should be given in great abundance; and Dr. Stevens says that, when the symptoms of typhus fever come on,—after venesection, and mercury, and cold affusion have been freely had recourse to,—no time should be lost in pouring in neutral salts. He says he has strong evidence to shew that, where these fevers have proved fatal to a frightful extent, the mortality has been reduced almost to nothing, by practitioners having listened to his advice. By giving neutral salts (as the carbonate of soda, the oxymuriate of potass, and common salt) every hour during the disease, the beneficial effect has been infinitely beyond what any one could have anticipated. I know that this gentleman states nothing as a fact, but what is strictly true. If he merely give an *opinion*, of course (like other men) he may be wrong; but upon whatever he states as a *fact* you may place the greatest reliance; and if he say that a certain number of cases out of the whole number, have been cured, you may depend upon it that the statement is correct.

Before I conclude the subject of these fevers in hot countries, I must mention that, in the East Indies, the sun and moon appear to have a great influence upon them. Dr. Balfour has written a work upon what he has called "the sol-lunar influence;" * and he proves that bilious remittent fever, is most easily taken at new and full moon; that at new and full moon the disease is greatest, and relapse most common; and that those suffering from pernicious fever, which has destroyed the constitution, are particularly affected at that period. This may appear incredible or whimsical; but I have no doubt of the fact. I have seen medical men who have practised in the East Indies; and they say it is well enough for *us* not to believe it; but they have suffered enough to know that it is perfectly true. I do not suppose that it is to be ascribed to the direct influence of the sun and moon upon the body; but that it arises from the operation of these upon the tides. The new and full moon, with respect to the elevation of the water, may have very great effect; and that, again, may have an effect, by causing more or less malaria to be disengaged; so that the atmosphere is more impregnated with it at those periods, than at others. I believe there can be no doubt whatever on the subject;—that at new and full moon, in the East Indies, fevers are most easily taken, relapse is most common, and fevers are most intense; and that those who have suffered most from these fevers, then feel a strange sensation about them;—just such as we continually find here, when the east wind blows upon a person who has previously laboured under ague.

CUTANEOUS DISEASES.

I have spoken of those diseases which may affect various parts of the body;—inflammation and different structural diseases; and have termed them *general* diseases. I have spoken, likewise, of certain diseases which appear to pervade, nearly or entirely, the whole of the body; and may be called *universal* diseases. I now come to the affections of particular parts; and I said that I should proceed from the head to the foot,—*a capite ad calcem;* that being as good an arrangement as any; and much more serviceable than an alphabetical arrangement, at any rate; for, in this way, diseases which are situated in contiguous parts, and must therefore have many symptoms in common, are considered together.† Before we begin with the head, it will be better to consider those which affect the surface; and after we have gone over the surface, we can proceed into the interior.

The diseases of the surface of the body are commonly called *cutaneous* diseases. They are far more numerous than, from the

* "Treatises on the Effects of Sol-Lunar Influence in Fevers, &c.; by William Balfour, M.D."

† The advantages which Dr. Elliotson here contemplates, are best secured by Dr. Fletcher's "Physiological Arrangement of Diseases;" for which see Appendix, No. IV.

works of Dr. Willan, and his pupil Dr. Bateman,* you would imagine them to be. Their works may be considered as the same; for the labour and honour was Willan's; and Dr. Bateman added little to what he learnt from his master; who was profoundly read in cutaneous diseases, and had laboriously observed them. With the generality of readers, Dr. Bateman's reputation is as great as Willan's;—just as smatterers in phrenology speak of Gall and Spurzheim as equal; though the originality and glory is all Gall's; and his pupil, Dr. Spurzheim, learnt the science from him; worked under Gall, as his assistant; and has merely added to and improved upon Gall—(if he *has* added and improved; which I will not deny); and stands at a humble distance from his master. The best work on cutaneous diseases I conceive to be that of a French writer, Rayer. He treats of all the diseases of the skin and its appendages;—thus taking a more enlarged view than Willan; and he treats of a much more considerable number of affections of the skin itself. When I say that Rayer's is altogether a much better book than Willan's, I do not at all wish to depreciate the latter; for a great part of the merit of Rayer's is ascribable to Willan. As far as Willan went, Rayer is under great obligations to him. Willan preceded Rayer; and the arrangements of the latter, in reference to the subjects treated of by the former, are grounded altogether on his publication. Rayer's is the best book, on account of its arrangement, the greater number of diseases of which it speaks, and the fuller and more scientific account of the nature, causes, and treatment of the diseases. Whoever would translate Rayer (omitting his cases, so as to lesson the unnecessary size of the work) would find he had entered upon a speculation so successful, that Bateman's superficial work, synopsis only as it is, would be superseded.†

Rayer divides the diseases of the surface of the body into four groups. I. Diseases of the skin itself. II. Diseases of the *appendages* of the skin;—such as the nails, and the cutis which furnishes the nails. In this division are to be found whitlow, and morbid affections of the nails, the hair, and sebaceous follicles. Here he treats of plica polonica, baldness, greyness, &c. III. Foreign bodies which sometimes beset the skin; as others do the intestines. These are divided into inanimate and animate;—*inanimate*, such as the sebaceous matter on the scalp of new-born infants;—*animate*, which I need not say include fleas, bugs, and lice; together with certain other animals of which we shall speak. IV. Those affections which commence in other parts of the body; and afterwards implicate and disfigure the skin;—such as the disease called *elephantiasis*; in which the skin becomes implicated only secondarily. You will observe that this is a fine comprehensive view of diseases of the surface of the body.

* "Description and Treatment of Cutaneous Diseases; by Robert Willan, M.D." "Practical Synopsis of Cutaneous Diseases; according to the Arrangement of Dr. Willan; by Thomas Bateman, M.D."

† Rayer's work has since been translated by Dr. Willis; Librarian of the Royal College of Surgeons, London.

Then, when we consider diseases of the skin itself,—truly cutaneous diseases, they are arranged by Rayer into six classes; and this is also a most excellent division. 1. All those diseases of the skin which are *inflammatory*. 2. Those which are mere *congestions;* and cutaneous and subcutaneous *hæmorrhages*. 3. Those which are *nervous* affections of the skin; such as morbid or deficient sensibility of it. 4. Changes of *colour* in the skin;—not at all dependent upon congestion. 5. Morbid *secretions* of the skin. 6. Diseases of the *structure* of the skin. This is a very useful view of diseases of the skin itself. They are arranged by Willan without any reference to their real nature. Willan's work (and Bateman's) is rather one of Natural History than Pathology. His delight and excellence was in the description of appearances. Rayer's work is excellent for deeper matters. This is the natural progress of knowledge. First, perfection is attained in distinguishing the *outward appearances* of objects and phenomena; and this accomplished, their *nature* and *causes* come next to be investigated. Willan accomplished much, though greatly indebted to foreign predecessors; but his labours were only a stepping-stone to what then became important. Again, I entreat you not to think I wish to depreciate his work; but we must not rest contented with progress no greater than he was able to make, in the science and treatment of cutaneous diseases.

It is of the greatest importance always to consider whether cutaneous, like other diseases, are inflammatory or not; and we therefore group all those that are inflammatory together. Then all those are naturally grouped together, that depend upon congestion; such as ecchymoses, cutaneous tumours, and subcutaneous bloody tumours, —sometimes called *nævi materni*. Thirdly, those which are seated in the nerves of the part; fourthly, changes of mere colour; fifthly, morbid secretions; and sixthly, malformations, and structural changes of the skin. In this way we shall bring before us all the diseases of the skin itself.

It is very important that we should recollect that, although these are called diseases of the *surface* of the body, many of them are affections of a much deeper nature;—that the affection is frequently connected with, or dependent upon, a general diseased state of the system. Frequently the mucous membranes are affected as much as the skin;—for example, the conjunctiva of the eye, the Schneiderian membrane of the nose, and the mucous membranes of the mouth, throat, and of the whole of the air-passages and alimentary canal. All these parts are liable to be affected, in some diseases of the skin. I need not tell you that in measles, (which is called a disease of the *skin*), we frequently have inflammation of the various mucous membranes which I have just named. So in the disease which is called *purpura*, and which is considered a disease of the skin, because there are purple spots on that organ, we have often the same appearances within, as upon the surface. I formerly mentioned that this was as much an *inflammatory* disease as one of congestion; and it may be *entirely* inflammatory. You will see the intestines, the lungs, and

the liver, beset with black patches, and even parts within the head; for, in this disease, blood has sometimes been effused in such quantity, that apoplexy has occurred. Although these diseases particularly affect the *skin*, yet in many of them, before the affection of the skin appears, there is some *internal* derangement; which occasionally ceases when the external affection appears, but which sometimes continues throughout. In many there is an internal derangement, at a certain time, during an affection of the skin. In many of these cutaneous affections, the whole system appears more or less in an inflammatory state; and in others the whole system is in a state of extreme debility,—complete exhaustion. Although, therefore, these are called diseases of the *skin*, from their producing very prominent symptoms there; yet it is to be remembered, that many of them are of a more deep and extensive nature. Many, of course, are *really* local; such as a change in the *colour* of the skin,—called *pityriasis versicolor;* where a person has a yellow appearance of the skin;—a thing very common on the necks of young women; and diseases of the *appendages* of the skin; such as diseases of the nails, and various affections of the hair and sebaceous glands. These are pure diseases of the integuments of the body; but many affections, called *cutaneous* diseases, are only cutaneous in one point of view.

The *inflammatory* diseases of the skin are spoken of, by Rayer, under various classes; according as there is *minute* or *extensive* inflammation; according as the inflammation produces a secretion of *water* or of *pus;*—and according as the inflammation is attended by *scales*, or produces a *tubercular* appearance. The inflammatory diseases are arranged by Rayer, much in the same way that Willan arranges *all* the diseases of the skin. The latter arranges cutaneous diseases, first, accordingly as there are mere pimples, without any contents;—*papulæ*. Secondly, accordingly as they are scaly;—*squamæ*. Thirdly, accordingly as there are diffused patches of redness;—*exanthemata*. Fourthly, as there are collections of water;—*bullæ*. Fifthly, as there is a secretion of pus;—*pustulæ*. Sixthly, as there are little vesicles;—*vesiculæ*. Seventhly, those in which there are tubercular appearances on the skin;—*tubercula*. And, eighthly, those in which there are stains;—*maculæ*.* Several sets of diseases thus arranged by Willan, come together in the arrangement of Rayer, under the one head of "inflammatory diseases."

You see, therefore, that the diseases of the integuments of the body may be considered, in the first instance, accordingly as they are diseases of the skin *itself*, or of the *appendages* of the skin; as there are foreign bodies upon the skin;—which cases are still allowed to be called diseases of the skin; or as the disease begins in other parts, and implicates the skin. And then the diseases of the skin itself may be subdivided, in the way I have already stated, into inflammatory, congestive, nervous, changes of colour, morbid secretion, and structural changes. The *inflammatory* diseases of the skin are

* This arrangement will be found, more at large, in the Appendix, No. V.

arranged by Rayer, first, as they occur in *patches* of inflammation;—*exanthemata;* then, as they produce collections of *water;*—*bullæ;* then, as there are *minute* collections of water;—*vesiculæ;* then, as there is *suppuration;*—*pustulæ;* or as there is *more extensive* suppuration;—*furunculi;* then, as there are mere *specks* of inflammation—*papulæ;* then, as there are *tubercular* appearances;—*tubercula;* then, as there are *scales* produced;—*squamæ;* then, as there is inflammation in *lines;*—*linear* inflammation; then as there exists a disposition to gangrene;—*gangrænosi;* as plague, malignant pustule, and glanders; and then he makes a class called *multiform;* in which diseases have no fixed appearance;—such as syphilis. It appears to me, that the most simple way of considering these inflammatory diseases, is to consider them, first, when the inflammation is in the most *minute extent;*—simple inflammation not larger than the point of a pin;—*papulæ.* Then we shall come to a more extensive inflammation;—*exanthemata;* then to one which produces a little collection of *water;*—*vesiculæ;* then to a *large* collection of water;—*bullæ;* then, where *pus* is secreted;—*pustulæ;* then, where pus is secreted in *larger quantity*;—boils, or *furunculi;* then to where the inflammation proceeds to *gangrene;* then where there is *organic* disease; first of the *slightest* kind (only of the cutis) as in the *scaly* diseases;—then of a kind more deeply, as in the tubercula; and thus we shall go on in a more natural way, than that which Rayer has adopted.

PAPULÆ.

We now enter upon the consideration of inflammatory diseases of the skin itself; and, in the first place, we shall speak of those which produce no secretion whatever;—no pus, no water; but which consist simply in inflammation, and that of the most limited extent; producing a little *speck* of inflammation. Of course there may be a *number* of these little spots. When inflammation of the skin appears in minute spots, these are called *papulæ*; the English of which is, strictly speaking, *pimples.** The word "*pimple*" is commonly used to signify any little elevation or inflammation of the skin;—whether there are no contents, or whether there is water or pus; but in proper language, and to be very correct, by a *pimple* is meant a minute inflammation of the skin, causing a very small accuminated elevation of the cuticle, without any contents whatever. Dr. Willan's definition of a papula, or true pimple, is—"a very small accuminated elevation of the cuticle," (I should suppose of the cutis and the cuticle together) "with an inflamed base; not containing fluid or tending to suppuration; but, for the most part, terminating in scurf." The duration is uncertain; but it has a tendency, in general, to terminate in scurf. If such a slight inflammation be attended by watery contents, it is called a *vesicle;* but if the contents be pus, we call it a *pustule;* so that with respect to the most minute inflammation of the skin, we may have a papula, a vesicle, or a pustule;—in

* The word "*papula*" is derived from "pappa," *a nipple;* and the diminutive "ulla" (from υλη); and signifies, therefore, "a little nipple."

other words, mere *inflammation*, inflammation with *water*, or inflammation with *pus*.

When this minute inflammation (papula) has no contents, it is then that it usually terminates in scurf;—scurf being a very minute exfoliation of the cuticle; which will take place, not only with evident inflammation, but sometimes with so exceedingly slight a degree of inflammation, that we can hardly call it more than a little irritation. A new cuticle is found underneath the exfoliation. There is no rawness produced; but under the minute portion of cuticle which comes off, we see a fresh cuticle. There is no moisture at all; the parts being still perfectly dry.

These papulæ are considered, by Dr. Willan, as inflammations of the papillæ of the skin; which he considers to be enlarged, elevated, and indurated; but I should think, if it be the papillæ which are inflamed, we should be justified in saying, as I *have* said, that there is something more than elevation of the cuticle. If the papillæ be inflamed, of course we must consider the disease as situated in the cutis;—the cuticle being elevated above the skin itself. The inflamed base cannot be in the *cuticle*;—that is out of the question; and therefore it must be situated in the *cutis*. Where these papulæ (which are, more or less, of a red colour) occur, there is an uneasiness experienced; which may be called pain; but it is pain of an itching character;—a *painful itching*, we might say. Inflammation of this description may end in resolution, without any formation of scurf; or it may terminate in a more extensive separation of the cuticle, which is called *desquamation*;—a separation of the skin in scales. For the most part, however, the cuticle is separated in such minute portions, that it is only a fine dust (a *scurf*) which comes off. If this inflammation be increased by the person rubbing or scratching, or by heat improperly applied, you may carry on the inflammation to the formation of water; so that you convert the papula into a vesicle. Again, if you add still more irritation, you may cause it to produce pus;—you may easily convert it to a pustule. If the individual scratch himself still more, and great irritation be excited, instead of mere pustules you may have boils;—pretty large collections of pus; but all this is not the tendency of the disease itself. These papulæ, which consist of mere spots of inflammation, are not contagious.

Dr. Willan makes *three* kinds of papulæ; but I think it would be as well to say that there are but *two*. These are the strophulus, or red-gum, of children; the lichen of adults; and the disease called *prurigo*. His first plate contains a good representation of them. I cannot but believe that strophulus and lichen are purely the same disease; and I think it would be a lucky thing if the name "*lichen*" were given to both; or if both names were dropped, and one term substituted for them. The disease called *prurigo*, is characterized by great itching; and is often mistaken for itch. Neither lichen nor prurigo has any particular name in English.

STROPHULUS.

This disease is peculiar to infants, and is called, by the common people, *red-gum* or *red-gown*. It is supposed that "*gum*" is a corruption of "*gown*;" and, in some old Dictionaries, it is still written "*redde-gowne*." It is also occasionally called, by the common people, the *tooth-eruption*. It is a very unimportant disease. The least irritation will cause it; whether in the gums, abdomen, or other parts of the system; and, with a very little attention, it goes away. In fact, it need never create any alarm. It is divided, by the common people, into *red* and *white*. Several parts of the body are affected in succession;—it does not come out at once. It chiefly affects the face and extremities; and is sometimes intermittent;—not *periodical*; but it comes and goes.

There is no difficulty whatever in treating it. If you give the child a dose or two of gentle physic, for the most part the affection goes away. If you be aware that it appears under different varieties, you will not be surprised when you see two or three cases differing a little from each other; but as to its making any essential difference in the disease, or in the treatment, that is out of the question. You will find most of these cutaneous affections represented, extremely well, by Drs. Willan and Bateman. Those of which I have just spoken, will be found in Plates i, ii, and iii.*

You will find it divided, by authors, into a number of tiresome varieties; which only serve to burden the memory, and are soon forgotten when you come to practice. The great point which I would urge upon you at present is, to recollect the characters of diseases *in general*; and as to the particular *varieties*, learn them afterwards, as different cases present themselves to your notice; and then do not trouble yourself so much about the *names* of these varieties, as about remembering the fact that there *are* some varieties in the appearances of the affections; and still more (what is not enough dwelt upon by subdividers) some varieties in the condition of the *system*, and of the *part affected* in these diseases. It is impossible to recollect all the minute divisions of these different diseases, without seeing patients; and then it is impossible to learn them all at once. It is a work of time; and there can be no doubt it would be quite as well, if many of them were not so subdivided by authors. You will find this particular affection divided into, 1. Strophulus *intertinctus*. 2. Strophulus *albidus*. 3. Strophulus *confertus* (Plate iii; Figure 1). 4. Strophulus *volaticus* (Plate iii; Figure 2). 5. Strophulus *candidus* (Plate iii; Figure 3). Some of these names I shall forget, as soon as I have given the lecture. It is right however, you should know, that the disease which you see in babes, and which is called by old women *red-gum*, is called by Dr. Willan *strophulus*.

If the papulæ be of a vivid red colour, but are intermixed with red dots or specks, called *stigmata*, it is then called "strophulus *intertinctus*."

* Dr. Elliotson chiefly employed the quarto plates of these authors, to illustrate the appearance of Cutaneous Diseases. We shall, therefore, merely refer to their numbers; in order to avoid the repetition of their names.

Willan defines a *stigma* to be a minute, bright red speck, *without* elevation. If the papulæ consist of whitish specks, it is called "strophulus *albidus*;"—that is to say, *white gum*; and this is often intermixed with the other. If the papulæ be all united together, in the way you observe in Plate iii, Figure 1, it is called "strophulus *confertus*;" and, by the common people, *rank* red-gum, or tooth-rash. It is hardly worth while to give particular names to these little variations of the disease. You will sometimes see different varieties in different parts of the same child. If the papulæ of strophulus be of large size, and have no inflammation at their base, they are called *absolutely* white,—"strophulus *candidus*." This, you see, is a contradiction; for a papula, according to Dr. Willan's definition, is an acuminated elevation of the cuticle, *with an inflamed base*. This variety usually succeeds acute diseases of children a year old. If after continuing some time, they produce a scurf, and then disappear, and another crop comes on, it is then called, "strophulus *volaticus*;"—coming and going;—continuing but for a short time. The patches are circular; and turn brown in a few days; and the whole series ends in a few weeks. I am sure it must be difficult to remember the differences, which occasion the diseases sometimes to be called *candidus*, and sometimes *albidus*. The important point will be, however, not to recollect the names of these little particulars, but to remember what I am about to say, with regard to the general character of the disease. It is sometimes pretty severe; and a great many papulæ are crowded together; and then the variety is called "strophulus *confertus*;" the papulæ are extensive, crowded, smaller, and less vivid. This form will occur in children from seven to eight months old. The patches may be hard; and they usually exfoliate in a fortnight. In this severe form, it sometimes begins in the legs, and spreads upwards to the loins and navel, with a general redness;—the cuticle cracking into large pieces; and this will occur every now and then, for two or three months. Some children will labour under it, till they have cut all their first teeth.

With regard to the *causes* of it, I believe that any little irritation of the alimentary canal will produce it. The irritation of teething, and very frequently exposure to cold,—especially if aided by wet,—will induce this, and various other inflammatory diseases of the skin. With regard, however, to the treatment, whether the disease appear in this aggravated form or not, one of the best things is to give mild purgatives, with some alkaline matter; as, for example, a little Liquor Potassæ, or carbonate of soda, or magnesia, two or three times a-day. There is, generally speaking, acidity; which may be corrected by something of this description. Moderate aperients can be given at the same time; and the warm bath is found particularly useful. If the disease should prove obstinate, I would certainly give Hydrargyrum cum Cretâ;—mercury in a very innocent form; but for the most part it is not required. Great attention should be paid to the diet; for, very frequently, the disease arises from some little error in that respect;—something improper having been accidentally

(or regularly) given. If the disease suddenly disappear, you may find the child evidently in want of stimuli; and when that is the case, a few drops of liquor ammoniæ, two or three times a-day, will be of use; particularly if it be conjoined with the warm bath, and good nutritious food. The warm bath is one of the most important things that can be had recourse to, in diseases of the skin, when you want to bring out an eruption, or to encourage it. I am told that the warm air-bath does as well; but I have no experience of it. To avoid cutaneous irritations, nurses should always *wash* infants' napkins, and not merely *dry* them.

In this disease, if you should find a pretty active inflammation of the skin, you would of course give stronger purgatives; and there might be no harm in applying leeches. If, on the other hand, you found debility, it would be well to give tonics;—iron or quinine; and to order nutritious diet. You will find that cutaneous diseases occur in all states of the body. Sometimes there is such debility, that you will not be able to cure the affection without the temporary use of meat, wine, porter, iron, &c.; while, in other cases, there is an inflammatory state of the body, making it evident that bleeding must be had recourse to, and low diet. So, in this disease of children, sometimes there is debility of the whole body;—the disease continuing because the whole system is out of order; and then better nourishment and tonics will be required. In other cases, local bleeding and stronger purgatives will be necessary; but, in general, all that is wanted is a warm bath, and alkaline and aperient substances.

In this disease, you should be particularly careful that the child is not exposed to cold. It is dangerous to put a sudden stop to the eruption, by allowing the child to catch cold. It is possible that the eruption may cease, and that the child may fall into a state of depression; in which case the warm bath will be required. But it may fall into an internal inflammatory state; and in that case, also, the warm bath may be useful; but antiphlogistic measures may be required in addition; for when eruptions suddenly cease, there is often an internal inflammation suddenly set up. It is right you should know that these accidents may happen; but, for the most part, the disease is a mild insignificant affection; more a matter of curiosity, indeed, than anything else. I show you a representation of these affections, in Rayer's work. It is copied from Willan; but the diseases are put in a smaller compass.

LICHEN.

The affection which occurs in adults, and is similar to strophulus, is called *lichen*. There is scarcely any difference in the appearance of these diseases; and I have always been accustomed to consider them as the same;—affecting children, and called *strophulus*;—affecting adults, and called *lichen*. Last year, when I read Rayer for the first time, I was glad to find that he entertained the same opinion as myself. I always spoke of them as the same; but I thought I might be wrong; for I do not pretend to be so skilled in these

matters, as those who have devoted themselves entirely to them. But Rayer says he should unite them, were it not for the fear of introducing a new division in the history of papular diseases, which Dr. Willan has described with minute accuracy. It is only from the fear of introducing more confusion, by altering matters as they stand, that he does not treat them as the same disease. I think it had better be done, as it would simplify the matter at once, and burthen the memory with one disease and set of names the less.

This disease, in adults, usually occurs in the extremities; and particularly on the outer and posterior parts of the extremities. The size of the papulæ is that of the head of a very small pin; and they generally terminate in scurf. The disease is sometimes acute; sometimes recurrent; sometimes chronic; sometimes general; sometimes partial; and sometimes connected with internal disease. It is divided, by authors, into—1. Lichen *simplex* (Plate iv; Figure 1). 2. Lichen *pilaris*; that which occurs particularly about the roots of hairs (Plate v; Figure 1). 3. Lichen *circumscriptus*; a form in which the papulæ are clustered together (Plate v; Figure 8). 4. Lichen *agrius*; a very severe form indeed (Plate iv; Figure 2). 5. Lichen *lividus* (Plate v; Figure 2.) 6. Lichen *tropicus*. 7. Lichen *urticatus*. In the simple form, you must expect the papulæ to be larger than when they occur in children. If they be very severe, they cluster together; the skin becomes inflamed; and they form deeply red patches. These affections are represented by Rayer;—Plate 6, first division.

It is said that the simple form of this complaint lasts generally from ten to twenty days. Sometimes, before it comes out, there is a smart degree of feverishness, with headache and nausea. It is sometimes rather a sharp disease; but there is nothing dangerous in it, though the general excitement is great. It is said that when it occurs about the hairs, "lichen *pilaris*," it is often chronic. When it occurs in the severe form, called "lichen *agrius*," there is a great degree of itching, and a great degree of heat; and the inflammation is sometimes so violent, that you have vesicles and excoriations. This severer form of the disease, is sometimes preceded and accompanied by nausea, pain at the stomach, and pain of the head; and may last several weeks. It is much more frequent in women. It corresponds with "strophulus *confertus*." This variety is sometimes connected, but only locally and temporarily, with a pustular disease, called *impetigo;* with another, in which serum is secreted;—*eczema;* and another, in which scales are formed, called *psoriasis;* and sometimes it will degenerate into them. Sometimes, though rarely, the papulæ are livid; and the variety is called "lichen *lividus*." More frequently it is united with petechiæ; or dark spots of congestion. There is one kind of this affection, called "lichen *tropicus*," which is attended by a great degree of tingling. You will find this mentioned by all writers on the diseases of hot climates; and it is described by them as a most distressing affection. When a person is subject to this variety of the affection, the moment he goes to bed or takes

exercise, he has a most violent pricking of the skin, called *prickly heat.* It is called lichen *tropicus,* from the disease occurring in tropical climates. It is not easily repelled; and its sudden cessation is generally the *effect,* not the *cause,* of an internal affection. The "prickly heat" is thought to be a sign of good health. Sometimes the papulæ, in this disease, are attended with little bumps, like gnat or bug-bites; and then it is called "lichen *urticatus.*" It affects the neck and face,—particularly in spring and summer; and is attended by a stinging pain. But though there are bumps or wheals, still there are papulæ. It chiefly affects the neck, face, and hands. It corresponds with "trophulus *candidus.*"

Lichen will sometimes be preceded by nausea, vomiting, and pain of the head; and sometimes these will disappear as soon as it comes; while, at others, they will continue with it. It sometimes takes place at the end of certain cutaneous diseases. It particularly occurs after fever and catarrh; and, it is said, even after peritoneal inflammation. Some persons regularly have it annually; some have it at the beginning of the summer; some in autumn; and some are so unfortunate as to have it in both. I know a young lady who had it every spring and every autumn. It was observed by the Romans, who called it *Sudamina;* and the Greeks, who noticed it, called it Ἴδρωα. In this country, in hot weather, we often have a great tingling of the skin.

In all these forms of the disease, the treatment is to be the same as in the strophulus of children. If there be great excitement of the system, and headache, one would bleed. If a patient have a strong pulse, even *without* excitement, you will find that by far the shortest way is to take a little blood from him, put him on low diet, purge him well, and order him the warm bath. You must not allow the *hot* bath; for, if you apply much heat to the skin, you will in a great number of cases make matters worse. Just as in the case of the strophulus of children, purgatives (especially combined with alkaline matters) given two or three times a-day, and low diet, will usually remove lichen; but if the disease be severe, certainly the shortest way is to bleed in the arm in addition, even if the severity of the disease do not *indicate* this measure, yet if the constitution of the patient and his pulse *justify* it, I should still have recourse to it.

For the relief of the parts themselves, which are tingling and itching, I think you will find the chlorides of lime and soda answer better than any thing else. Many persons use vinegar for this purpose; and it answers pretty well; but I think that, in all cases where there is itching of the skin, if that organ be sound, and the chlorides be properly diluted, they are by far the most serviceable. I have known some persons relieved by the application of prussic acid, of the strength of a drachm to eight ounces of water;—sometimes stronger. I had an old man at St. Thomas's Hospital, lately, with great inflammation of the legs, connected with varicose veins;—which is certainly not exactly this disease; but nothing relieved him except prussic acid;—one ounce to a pint of water. Sometimes,

however, this will produce heat and tingling; and it is best not to use at first more than a drachm or two drachms to a pint; but, if this produce no effect, you may increase it; but now and then there is great heat and dryness induced by applying it in greater strength. You will find that bleeding at the arm, low diet, and purging, are the best general means; and, as local remedies, either vinegar, prussic acid, the chlorides, or plain water, warm or cold.

PRURIGO.

In prurigo, the papulæ are very little discoloured;—being nearly the same colour as the skin; but they are larger than in lichen. They are particularly characterized by itching; and the itching is a far more striking symptom than the eruption itself. That is not the case in the other two varieties, except in that form called "lichen *tropicus*." In the latter there is a very severe eruption; whereas, in prurigo, the eruption differs but little from the adjoining skin. The papulæ also vary from those of lichen, in not being so pointed. So severe is the itching, that people scratch themselves, till they rub off the surface of the papulæ. A little blood exudes;—a very minute portion; and then it forms a little black crust; so that the papulæ will have an artificial black top; and, from scratching them, water will ooze as well as blood. This, however, is incidental; and has nothing to do with the complaint. If the patient will continue to scratch, he may cause these papulæ to be converted into vesicles; if he scratch still more, suppuration will take place, and he will have pustules; and the skin may even be brought into such a state, that it will crack, and become indurated and hypertrophied. This is a chronic disease. Lichen and strophulus are sometimes chronic, and sometimes acute; but prurigo usually lasts a considerable time, unless properly treated at an early period.

If the disease occur in the mildest form, it is called "prurigo *mitis*." This chiefly affects the young. The disease altogether, in every variety, affects both the young and the old; but that called "prurigo *mitis*" principally affects the young; and occurs particularly about the spring or beginning of summer. It is said, by some, to degenerate into the itch; but others deny this. Sometimes the eruption is scarcely visible at all. There is intense itching, but it is rather difficult to find out any eruption. It will remit; and sometimes it will *intermit*;—come and go entirely. If it be very severe, there is an epithet added to the word "*prurigo*," to signify great intensity; and, from the itching resembling so much the bite of an ant, it is called "prurigo *formicans*;" which is a very severe,—I may say a *dreadful* disease. It affects adults at all periods, but not children; and it occurs in every part of the body, except the palms of the hands and soles of the feet. Occasionally it is preceded by feverishness, pain of the head, and sickness. There is a third form, which is confined to old age; and which is called "prurigo *senilis*;" and this is likewise a very severe form of the disease. I should sometimes be at a loss to distinguish between "prurigo *formicans*" and

" prurigo *senilis*;" for the former only occurs in old people. I think it would be better to say, that prurigo is a disease which sometimes is mild, but now and then severe. If it attack old people, it generally continues very obstinate, for a great length of time. Figure 1 (Plate vi) represents " prurigo *mitis*;" Figure 2, " prurigo *formicans*;" and Figure 3, " prurigo *senilis*." There are no scales, or scabs, or water; nor is there any pus.

This disease is not dangerous to life; but it is sometimes really a most dreadful disease;—dreadful, I mean, so far as suffering is concerned; and, for what I know, it may injure the general health. I have known the intense suffering it occasions, sometimes cause imbecility of mind. The intense suffering has continued, month after month; and, indeed, year after year; and has produced such depression of spirits, and such exhaustion of mind, that persons have become imbecile,—really worn down; and a sort of fatuity has arisen from mere exhaustion. I once had a man come to me, in this state, at St. Thomas's; when I attended the out patients. He pulled off his coat, uncovered his bosom, and shewed me every part in an instant; —he was so quick in all his movements. He then pulled a comb from his pocket; and assured me that was the second comb he had bought; having worn out the first in scratching himself. I have no doubt this was true. The itching was most intense; and he had been in this state two or three years; so that there had been time to wear out a comb. About three years ago, I had a man who came to the hospital; and whose sufferings had been nearly as intense. The idea had not occurred to him of buying a comb; but he used his nails well in scratching himself. His mind was as much gone as that of the other patient. He was really falling into childishness.

This disease is sometimes local; attacking a particular part of the body only; and not being diffused. It affects, particularly, the scrotum of the male, and the pudendum of the female. The scrotum, from constant irritation,—from the patient everlastingly scratching himself, becomes scaly, and very much indurated. It will attack the prepuce; and then it is called " prurigo *præputii*." Sometimes it has occurred within the urethra;—" prurigo *urethralis*." It will sometimes affect the extremity of the rectum;—" prurigo *podicis*." The worst seat of it, however, is in the pudendum of the female;— " prurigo *pudendi muliebris*;" and there it is sometimes very violent, —very distressing; so that a woman cannot go into society at all. She cannot appear before men; nor, indeed, can she appear before strange *females*; in consequence of her being under the necessity of scratching herself. I have known women driven almost mad, with the vexation of finding that they were not able to pass five minutes, without scratching themselves violently. I saw one woman, who was obliged to get up several times in the night. She was unable to go to sleep; for, at last, the heat became so great, that she was compelled to get out of bed, and wash herself with cold water; and so she had passed every night, for months, when I saw her. The vagina and the inner surface of the labia, in very severe cases, become

thickened; and bumps of induration (small indurated portions) are formed here and there. They are not properly tubercles; but have a tuberculated appearance. When this occurs in females, it excites a desire of copulation; which, as they have told me, relieves it for a time; but in a little while afterwards, they are worse than ever. It is impossible for them to get relief, in this way, every moment; and I advised the woman to whose case I had just referred, and who told me that she lived separately from her husband, to use nothing but cold water. It is really, though not dangerous to life, a distressing disease; and women will cry, and absolutely wish for death, when they are labouring under it. I cannot conceive any thing more lamentable; and, if it occur to a modest woman, it is the most horrid sort of case that can come before you. It rarely occurs in females before the middle period of life. Dr. Willan says, that aphthæ may appear on the nymphæ, and internal part of the labia; and may be communicated to the glans, penis, and internal part of the male prepuce; that they are easily cured; and that these aphthæ, as well as "prurigo pudendi muliebris," often occur after the fourth month of pregnancy.

The mild form of prurigo may be mistaken for itch. I will not trouble you with the diagnosis now; but advert to it when I speak of itch. I may mention, however, that it will occur in every part of the body. It will occur in the face, as well as other parts; but the itch, I believe, will not. Prurigo, too, is not a *contagious* disease.

With regard to the treatment, supposing it to be the mild form of the disease, it is right to make the patient avoid stimuli of every sort;—pepper, mustard, wine, beer, &c. Many persons have a tingling, immediately on taking certain articles. If I take a grain or two of pepper, or taste vinegar, I have an itching of the scalp; and wherever I am I must begin to scratch my head. If I take opium, I have a violent tingling of the nose, for many hours afterward. Now all these matters, especially mustard and pepper, are likely to increase the affection. If a patient will bear it, it may be right sometimes to take blood. At any rate, it is proper to purge him moderately; and I should advise alkalies, as there is often an acidity in the stomach. But there is a remedy from which I have found greater relief, than from any other;—not in the *mild* form only, but also in the *severe*; and one of the men I have mentioned, was cured by it;—at least, he was so far relieved, that I could keep him no longer in the hospital. That remedy is colchicum. I am sure that if you purge with colchicum, you will find more benefit than from any thing else. In the mild form of the disease, undoubtedly, this is the best remedy. Patients should avoid going near the fire, or taking much exercise, so as to irritate the skin; but I am quite satisfied that colchicum is the best remedy you can employ internally. As to the itching itself, that is very much mitigated by diluted acids, such as vinegar; and also by the chloride of lime, or of soda. These produce a very great mitigation of the itching. You will also find relief, sometimes, from a fomentation of prussic acid. The woman

who was so bad from "prurigo pudendi muliebris," found great relief, for a time, from applying prussic acid. She used it, at length, to such an amount, and of such a degree of strength, that it produced giddiness and fainting; so that she could not stand it; and yet it did not cure her complaint. It appeared, at last, that the best thing was a cold application; and therefore she had a pail of water brought into her room at night, and used it incessantly. I believe this local prurigo will arise, occasionally, from some local cause of irritation. Worms in the rectum, will produce "prurigo podicis;" and a stone in the bladder, is sometimes attended with a violent itching of the prepuce. In women, it sometimes attends structural disease of the womb. It is right to endeavour to ascertain whether there is a local cause; and if there be, you must endeavour to remove it; but if you cannot find a local cause, then I believe the application of the chlorides, or prussic acid, or cold water, is the best thing. Some tell me that they have seen great relief from what is called "the yellow wash;"—oxymuriate of mercury and lime water. It is much about the same thing as using the chloride of lime. The French use sulphureous baths, and emollient baths containing gelatine; but I have no experience of them.

EXANTHEMATA.

We now proceed to another class of diseases; a class in which the redness is not confined to spots, but forms patches. Such diseases as these are called *Exanthemata;* or (in English) *Rashes;*—a rash being an extensive redness of the skin. In these diseases there are not pimples or spots, but patches;—the same thing precisely, only of greater extent. They are defined by Dr. Willan to be "red patches, variously figured; in general running together (confluent); and diffused irregularly over the body; leaving interstices of a natural colour; and usually terminating in cuticular exfoliations, though sometimes disappearing without any such exfoliation." The former class of diseases (papulæ), you will remember, either terminated without any thing following, or induced a scurf. These, being a more extended redness,—being patches instead of pimples, are followed, not by scurf, but by an exfoliation of the cuticle. Large portions of cuticle separate; and therefore, instead of being branny or scurfy, it is in plates. These exanthemata often render the surface uneven, by elevating the portions affected. The brightness is variable; and sometimes, Willan says, extravasation occurs.

The chief diseases of this description are, in the first place, erythema and roseola; which I will unite together (or endeavour to do so) as I did lichen and strophulus. The next is measles; the next scarlatina; and then comes urticaria. Some of these are contagious, and others not. None of the first class were contagious; but two of these are;—namely, measles and scarlet fever. These two usually occur but once during life. The two first of these affections are very slight;—just like lichen and strophulus; and are not contagious.

ROSEOLA.

The first of these is roseola; and it is worth knowing, merely lest you should mistake it for something else. Roseola is described as having rose-coloured patches; without wheals, without little bumps, without papulæ, without minute elevations of the skin; and these patches are circular or oval. (Plate xxv.) It occurs at all ages; but especially affects children. When you see children with little rosy patches of the skin, circular or oval, the disease is called *roseola.* There is sometimes an itching attending it; and sometimes only a tingling. If it occur in children, it is called "roseola *infantilis.*" The patches are of all sizes; and sometimes they are diffused very generally over the body; but if not, still they are pretty numerous. It is a trifling eruption, and seldom lasts more than four or five days. If the patches be round, it is called "roseola *annulata.*" Sometimes there is a little feverishness, or a little irritation of the bowels; and those symptoms generally occur from two to seven days before the eruption appears. It is usually a superficial complaint; very innocent to the body; very short in its duration; and, after it, there is scarcely any exfoliation. The character of this eruption is said (by Rayer) to be that, after pressure, the redness returns at all points. In scarlet fever, if you press the rash, the redness, on removing the finger, returns from the circumference of the part; but, in roseola, every part recovers its redness at the same time. I never made the observation myself; and therefore cannot answer for its accuracy. Now and then it might be mistaken for scarlet fever; but, he says, that you may distinguish between the two affections, by noticing what I have just stated.

This is a disease of so short a duration, that it never becomes chronic, unless there be many attacks of it;—unless it be remittent. If it come and go, a patient may be troubled with it for a length of time; but the disease never remains incessantly, for any long period. In the spring and summer, it will no doubt frequently arise from the heat of the weather; but frequently it happens without any evident cause whatever. If it occur in the summer, it is called "roseola *æstiva*;" but if it occur in the autumn, it is designated "roseola *autumnalis.*" If it occur in small-pox, it is called "roseola *variolosa*;" if in cow-pock, "roseola *vaccina.*" It has various names, according to these circumstances; which names it is quite nonsense to attempt to remember. Occasionally you will see such rosy patches in continued fever; but still it is called *roseola.* The redness of the skin which you observe in gout, is also called *roseola.* The redness of the skin which you observe in rheumatism sometimes, especially of the fingers, bears the same name. Occasionally the mucous membrane of the throat, more particularly the pharynx, suffers the same degree of redness. It would appear that, occasionally, something of the same nature occurs in the stomach and intestines. At least, when there is this eruption of the body, there will be a violent degree of heat in various parts of the abdomen.

After inoculation for small-pox, this little redness will sometimes take place before the pustules appear. They say this happened in one out of fifteen cases; and inoculators used to imagine, that it betokened a mild form of the disease; but if the redness was general and deep, and there was much pyrexia, they supposed it indicated that the disease would be severe,—would be confluent. The roseola which occurs in cow-pock, generally appears on the eighth or ninth day.

This disease requires no treatment whatever; unless you choose to lower the child's diet, and give it a dose of physic. You will find it represented in Plates xxv, xxvi, and xxvii. The great importance of knowing this rash, is not for the sake of curing it; but in order to distinguish it from another disease; for many children have been said to labour under measles, or scarlet fever, when they have only had this redness of the skin. You will hear of children having had measles or scarlet fever, half a dozen times; whereas they had merely this little redness of the skin, called *roseola.*

ERYTHEMA.

The next disease is separated by writers from *roseola,* and is called *erythema.* It is said to consist of red patches, or diffused redness. It often affects the subcutaneous tissue; so that there is a little swelling. To shew you the absurdity of separating these two diseases, I may mention that one is called "red patches, variously figured and irregularly diffused;" and the other is called "red patches, or diffused redness." I am sure it is frequently impossible to distinguish between these two diseases. The different varieties of erythema are much more unlike each other, than many cases of erythema and roseola. All that you have to remember is, that a little redness is called either *roseola,* or *erythema;* that roseola occurs particularly in infants; and that erythema occurs sometimes in rather a severe form.

Erythema may be transient, and last only about a week; and then there is furfuraceous branny desquamation. Sometimes it is local, and will arise from friction; and then it is called "erythema *intertrigo.*" If the skin in the groin or arm-pits be irritated, the motion of the parts increases the irritation; and if they be accidentally irritated by the dress, then the redness will increase; and this is sometimes called *intertrigo.* However, when this redness is slight, it is called "erythema *fugax.*" If the skin be very smooth, it is called "erythema *læve.*" If it have a distinct margin, it is named "erythema *marginatum.*" If there be small papulæ, it is designated "erythema *papulatum.*" If, instead of papulæ, you have slightly elevated tubercles, it is called "erythema *tuberculatum.*" If you have large bumps, it is then designated "erythema *nodosum.*" You have seen legs become bumpy and red; and that is an instance of "erythema nodosum." You also well know, and you will remember, the shining appearance sometimes of an inflamed œdematous leg; and that state is called "erythema læve." You may as

well say that there is erythema with a smooth shining surface, as trouble yourselves to recollect that it is called "erythema *læve.*"

This disease is now and then preceded by a little illness; which disappears when the eruption occurs; and now and then there may be a little feverishness during the attack; but for the most part it is a trifling complaint; or is consequent upon some other affection; Rayer considers that, when there is an internal affection, the disease is the sympathetic effect of the internal irritation;—that an irritation of the stomach or intestines is the real cause of the disease; and not that this disease itself is at all capable of affecting the constitution. When persons are out of health, there will be an external inflammation, not attended with any secretion; and that inflammation is called *erythema.*

But there is a form of this disease which is very obstinate; and you are sure to be consulted upon it. It appears in great patches, chiefly on the legs, and particularly in females. If you draw your fingers along the legs, you will find bumps very hard and red. It is called (as I before said) "erythema *nodosum.*" Plate xxii, Figure 1, represents this disease. It is really worth looking at; because it is accurately delineated in this plate. You will be continually consulted respecting it, and asked to give it a name; and if you cannot you will be considered a goose. Of course patients place the more confidence in you, if they fancy you know what is the matter with them; and it is very natural that they should do so. It is very easily cured, if treated properly at first; but if it be neglected, it is a very obstinate affection. Now and then, instead of bumps, you have tubercles, in the common acceptation of the word. This is represented in Plate xxxi, Figure 1. This affection, as I just now said, is called "erythema *tuberculatum.*" You see that these are all superficial rednesses. The tubercles are like peas. It is worth knowing; because patients die when they have it, though I do not know that they die *of* it.

The best treatment for this disease, is anti-inflammatory;—in fact, just the same as for all the others that I have mentioned. If the patient's strength will bear it, you may take away blood with advantage; and you generally find it buffed and cupped. You may also purge the patient. In fact, you may treat him on the antiphlogistic plan; either purge him alone, or bleed him at the arm as well. If there be anasarca of the legs, you may favour its removal by posture. You cannot expect the erythema to disappear, while the leg is hanging down. It arises from the distention of the part; and if the distention of the part be allowed to remain, nothing will remove the erythema. The general rule, however, is to treat erythema as you would any other inflammation. In the erythema which occurs in the legs of females, you will not only find very great use from these measures;—that is to say, bleeding in the arm, the application of leeches to the neighbourhood of the part, and active purging; but you will find more benefit from colchicum than from any thing else. I have had great experience in the treatment of this

disease; and I know the comparative efficacy of combating it by purging with common cathartics, and by purging with colchicum. You will find colchicum the best medicine you can employ, not only in severe prurigo, but in this species of erythema.

I mentioned to you that, in one variety of this affection, there was great redness of the skin, with hard lumps;—not so large as in "erythema *nodosum*;" but small lumps about the size of peas, or small-pox pustules. This is a state of the parts which I have never seen but once; and then I confounded it with "erythema *nodosum*," and thought nothing of it;—imagining that I could cure it. The lumps had no sooner disappeared, than the man became paralytic; and then hectic; and died in an extraordinary way, with symptoms of various diseases. I was not then sufficiently aware of the distinction between "erythema *nodosum*," which is an innocent disease, and "erythema *tuberculatum*;" but Dr. Willan says that he had seen only three cases of "erythema *tuberculatum*;" and all of them proved fatal. Two of his patients died of hectic, just as mine did; and one died of subsequent hydrocephalus. My patient died hectic; and if he was not hydrocephalic, he had affection within the brain; for he was paralytic. Dr. Bateman says that he never saw the affection. The treatment, I presume, would be the same as for "erythema *nodosum*;" bleeding to a certain extent and colchicum. I gave it to this man; but, to my astonishment, he did not get well. Of course, this disease does not give rise to paralysis or hectic; but I presume it is one which only takes place in constitutions which are exceedingly bad;—which are strongly disposed to some internal disease; and when the patient is on the eve of labouring under it.

When you see patients with red patches on the skin, of this description, and with scarcely any complaint, you may be sure that the affection is erythema or roseola;—call it which ever you please. Now and then you have it very troublesome in females, and with bumps; and now and then you have the tubercular form; which is usually the prelude to a severe and fatal complaint.

URTICARIA

The next of the diseases in which the inflammation is extended in patches over the skin, is *urticaria*. I select it as the next because it is not a *contagious* disease; and, indeed, is almost always, a disease free from danger;—just like the three I spoke of in the class of papulæ;—namely, strophulus, lichen, and prurigo; and just like the two of which I have already spoken in this class;—roseola and erythema; except "erythema *tuberculatum*; which, although it will not itself prove fatal, occurs in persons who usually soon die of something else.

This disease, urticaria, is in plain English the *nettle-rash*. It is so called because the appearance is precisely that of a person stung with nettles;—*urtica* being the Latin for *nettle*. You find it spoken of by some writers under the term *essera*; which, I understand, is the Arabic name. I think Dr. Heberden speaks of nettle-rash under

that title. In this disease there are efflorescences, as they are called; —extended patches; but besides that there are wheals. I need not say that a wheal is a pretty hard elevation of the skin; such as occurs from a horse-whip applied to the surface of the body; but it is defined particularly by Dr. Willan, to be a rounded or longitudinal elevation of the *cuticle*. One ought to comprise more in it than that however. We might say, in general terms, "a rounded or longitudinal elevation of the *skin*;" but still we must add "not permanent; not containing fluid; and not tending to suppuration." Of course, if the *cuticle* be raised, (according to Dr. Willan's expression), there must be something under it. You would imagine there must be a vesicle, water, or pus; it is therefore, improper to say,— "elevation of the *cuticle*." The cuticle *is* raised; but you would have a wrong idea if you imagined, that the cuticle was raised from the other component parts of the skin. The cellular membrane indeed is raised, as well as the cutis; and there is a hard bump, and an extended efflorescence, or patch (or whatever you please to call it) around the bumps. This efflorescence is of a vivid red,—a very *intense* red;—sometimes really of a *damask* hue; almost the appearance which you observe in those persons said to have "claret-marks." Occasionally there are a few very small wheals; but sometimes not;— the *efflorescence* being the character of the disease; though, in the greater number of cases, in the midst of this efflorescence, you find these wheals; which look white in the midst of the red patches. There is an extreme itching;—that sort of itching which is called tingling; exactly as if a person were stung with nettles. To the eye of a bystander, and to the feelings of the patient, the state is just that of a person stung with nettles.

If the bumps be very hard indeed, they are much larger at the same time; and that variety of the disease has a particular name, and is called "urticaria *tuberosa*." It is sufficient to remember, that sometimes the bumps are pretty large and hard, and very painful; and if you choose you may remember, that when they are so it is called "urticaria *tuberosa*." These large ones, these thumping bumps, chiefly occur in the loins and legs, and are generally worse at night; subsiding in the morning, and leaving the patient weak. If it happen that these wheals and patches are numerous, and of irregular form and coalesce; it is called "urticaria *conferta*;" and these are said to occur chiefly in persons of a dry, swarthy skin, above forty years of age. If it so happen that the disease has been preceded or is accompanied by headache, nausea, gastrodynia, drowsiness, and pyrexia; it is called "urticaria *febrilis*." Very frequently, whether it is *preceded* by these symptoms or not, it is *attended* by them when it does appear. If they precede it they will still continue; but frequently they will come on only when *it* comes on. Generally, in severe cases, there is heat and thirst. The tongue is white, yellowish, and loaded; the epigastrium is tender; the pulse is full and quick; and now and then the disease will come on, like any other inflammation, with shivering. Now and then the internal symptoms, which

occur before the eruption, are relieved by it; or, at least, are diminished, or disappear; but they reappear when it ceases again. Frequently, however, these will all exist together;—the internal symptoms of feverishness; and the external symptoms of efflorescence and wheals.

This disease is sometimes so active, that the face is swelled, and the eyes are almost hidden. Persons say they can hardly see out of their eyes; and, in fact, you can see but little of their eyes; and every part around is swollen;—cheeks, lips, and scalp; and all are tense,—the nose among the rest. The eruption will vary in intensity, and vary in its situation, not only on different days, but at different hours of the same day; it will come and go several times in the twenty-four hours. Warmth will aggravate it; and, on the other hand, exposure to cold will do just the same. When a person undresses, and there is an application of cold air to a part of the surface which before was covered, it will frequently bring out the rash, and make it worse. On the other hand, if a person go into the other extreme;—if he stand near the fire, or take stimuli, he will be worse. I need not say that rubbing and scratching make things a great deal worse; but people will do so; and, on account of the pain, they really can hardly help it. This disease is often not confined to the surface. It affects the internal mucous membranes next the surface; and the submucous cellular membrane. You will often find the tongue, the fauces, and the throat swollen; so that the patient can perhaps hardly swallow. The irritation of the mucous membrane, in that quarter of the throat, sometimes occasions a degree of cough. I have frequently seen patients unable to swallow, and nearly unable to breathe. It is said (though I have never seen it) that, now and then, there is an irritation of the bladder, producing strangury; and sometimes diarrhœa is induced. The internal affection, in this complaint, is sometimes said to end fatally; but I presume this internal affection does not arise from the eruption. On the contrary, I imagine that it is the *general state* which gives rise to the *eruption*. The disease will last for a few days, perhaps a fortnight; and now and then there is a slight scurf afterwards. The cuticle, in consequence of the irritation, is separated from the parts beneath, and comes off in the form of slight scurf. This occurrence, however, is not a general thing.

Sometimes the disease is chronic; and is called "urticaria *perstans*." It is sufficient to remember that urticaria may be a chronic disease. The redness will go; but the wheals, perhaps, will remain. Now and then, instead of remaining chronic, it comes and goes for many months;—vanishing and recurring; and then it is called "urticaria *evanida*;" but I beg you will not trouble yourselves to remember these expressions. If you know that it comes and goes, or stays, that is sufficient; without knowing how authors arbitrarily choose to designate these varieties. Dr. Bateman says there is no pyrexia; but I know that there frequently is; and also an inflammatory state of the head and of the abdomen. It sometimes happens that the

eruption disappears, or only comes from time to time; and when the tingling comes between the appearances of the disease, it is then called "urticaria *subcutanea*." Perhaps you cannot well imagine a disease *of* the skin to be *under* the skin; but so it is called. It lies underneath; and teazes the patient without shewing its face.

Before I proceed to consider the *causes*, perhaps I had better shew you the *appearances* of the disease. It is an affection which people very often do not recognize. I know that it occasionally occurs in practice, that a patient is said to have any thing but urticaria, and is very much frightened; but it is easily recognized by the tingling and by the elevations or wheals. The affection is represented in Plate xxiv, Figures 1 and 2. You see that, in both forms of the disease, the wheals are slight. In the upper figure, there is a slight inflammation; and in the lower one, it is very great. It is as deep as damask, or "claret-marks." You sometimes see the redness with a few wheals; and people are often said to have erysipelas, when they have only this form of urticaria. There is frequently a swelling of the face too; so that some persons are very much alarmed. It sometimes occurs in children; and in them it may be more easily mistaken, at first, than in adults. It is often, in the first instance, mistaken for measles, or some other disease.

I believe that the most frequent cause of urticaria, is the application of cold; especially when the body is heated. It will frequently arise from cold applied to the surface;—sometimes cold and wet; but especially when the body is over-heated. It is, perhaps, sometimes induced by sudden heat. It will frequently arise from an emotion of the mind. It arises too from teething, and we continually see it, too, from certain ingesta. Some have it through *one* kind of food; and some through *another*. In some persons, almonds will occasion it; or rather the *skin* of almonds. It is not the *blanched* almonds that cause it, but the *unblanched*; so that it is the *external part* that produces the disease; and this it does in consequence of the skin of the almond containing hydrocyanic acid. The latter, in its medicinal form, will now and then have the same effect. Various kernels of fruit will give origin to it, in some people, in consequence of containing the same substance. Mushrooms, also, will sometimes occasion it. I suppose the mushrooms must be of peculiar kinds. Herrings, particularly *red* herrings, and shrimps, will likewise occasion it. Shell-fish are very often the cause of the disease; but I believe muscles produce it more frequently than other kinds. You hear of persons being poisoned with muscles; and they are said to swell. I imagine the idea of swelling from being poisoned, arises from this circumstance; that urticaria is produced by different substances; and when it is produced, the face often swells prodigiously, and sometimes even the whole body; and if persons have previously eaten muscles, they are sure to say they are poisoned. It is not worth the name of *poisoning*. So intense is the idiosyncracy of some persons, as to muscles, in reference to this disease, that a gentleman informed me he knew a woman, in whom urticaria was induced by

one tea-spoonful of the water in which muscles had been boiled. She always had urticaria if she tasted muscles; but having boiled some for her husband, and being extremely fond of them, she thought she might indulge herself with a little taste of them; and so she took a tea-spoonful only of the liquor; but it had the same effect as if she had partaken of the muscles. Crab-soup, which I suppose is much the same as the liquor in which muscles are boiled, will also induce the disease. Malt-liquor, white-wine vinegar, and common spirits, will, in some people, produce it. A medical man told me that his wife always had it if she took gruel. One of the most common causes, among medical substances, is copaiba. Many persons, on taking copaiba, are covered with nettle-rash. I had a patient in whom it was produced, in the greatest intensity I ever saw it, by the sulphate of quinine. I never knew this before. His eyes were closed; his face was so swollen, that his friends did not know him; he was in a most intense burning heat; and could scarcely breathe. Swallowing was impossible. His brother came to me, and told me of the circumstance. I wished to ascertain whether it was the sulphate of quinine; and I begged him to take only a grain. He complied with my request, and it had the same effect, only in a less degree. He then took a minute *fraction* of a grain. There was not more quinine than (as common people say) was "sufficient to swear by;" and even that produced a degree of uneasiness in his throat, and a certain tingling in his skin. I have known several persons, in whom the disease has been induced by laudanum;—in fact, by opium in any common form. I mentioned that, in my own case, whenever I take opium, I am sure, in two or three hours, to have an itching of my nose; which will not leave me quiet for several hours. The same substance, in other persons, will induce universal tingling of the skin, with bumps;—in fact, nettle-rash. Pepper, and various spices, will have the same effect. Pepper and vinegar occasion in me a great itching of the scalp. I once saw the disease induced, very violently, by a mixture of subcarbonate of iron with treacle: whether it was the iron or the treacle I do not know. External stimuli will induce it; and it may spread along the skin, so as to prevail to a considerable extent. Dr. Willan says he knew a person, in whom it was produced by a slight application of unguentum hydrargyri; and another who had it from rubbing the hands with oatmeal. It is worth notice that, when an irritant is applied to the skin, the effect is not always limited to the spot; but other parts, either around, or *to* some distance, or *at* some distance, may suffer. Croton oil often causes redness and vesicles, far beyond the spot of application. Tartar emetic, applied to the legs, often causes pustules in the genitals. For this fact I beg to refer you to a paper of mine, on Subcarbonate of Iron, in the thirteenth volume of the "Medico-Chirurgical Transactions."

With regard to the mode of treatment, the shortest way, if the patient's strength will bear it, is to take blood from the arm. Even if anything improper has been taken into the stomach, by bleeding

in the arm you produce almost instantaneous relief; and the patient will speedily get rid of the complaint. A friend of mine was taking copaiba, in consequence of his misdeeds; and next day was seized with an eruption all over his body. His face was swollen and burning; and his lips were so stiff, that he could scarcely move them to eat. The aperture of his eyelids became very small; his pulse was about 100, and full; he was in a great heat, and red all over. Before I saw him, he had taken an emetic to empty his stomach; but it was quite in vain. The capaiba had entered his system; and was there causing irritation. When I went to him, I immediately saw it was nettle-rash; and begged another friend, who was by, to put a lancet into his arm, and detract a quantity of blood. Before the basin was half filled, he felt relief; and as the blood continued to flow, he felt more and more benefit. He became paler and paler; the swelling of his face declined; and before evening he was tolerably well. He took a dose of physic to assist the bleeding; but I dare say he would have done without it. The venesection, notwithstanding the emetic had been fruitless, instantly relieved him. A short time afterwards, he found it necessary still to go on with the copaiba;—his other troubles not having ceased; and the same effect was again produced. He took no emetic that time, but was again bled; and the disease instantly disappeared. He had no further trouble. However, if you are sure that the cause is still in the stomach, in consequence of the short time which has elapsed since it was taken, it would be but common sense to empty it; but I confess, if the person were of full habit, I should take away blood first; for you will find that a most speedy mode of cure. You must, as in all other inflammatory complaints, regard the constitution of the patient on the one hand, and the intensity of the disease on the other. If you take away blood, you will cure the disease in perhaps a twentieth part of the time that will be required, if you trust to low diet and purgatives. I would, in every case, back bleeding by low diet and purging. In the chronic form of the disease, the patient should avoid stimuli, and adopt antiphlogistic regimen. He should avoid eating anything that can excite either his body or his mind; and if the pulse be strong, he should unquestionably lose a small quantity of blood. The warm bath is said to relieve the affection; and in some cases bathing has done good. Bark and acids are praised. All the cases, however, that I have seen, whether acute or chronic, have been best and most successfully treated by venesection, and common antiphlogistic measures. In the case of the lady who had urticaria from taking the subcarbonate of iron in treacle, for a couple of days, the eruption began one Sunday morning; and it was supposed that she had got scarlet fever. The eruption was just of the appearance you saw in the lower figure; of a damask red, with bumps; and it came out suddenly. She was in the greatest agony. Her countenance expressed great distress; but though I imagined it arose from the medicine, I did not give her an emetic. I had her bled; and while her noble blood flowed (for she was a peeress) the symptoms de-

clined; and when the arm was tied up, there was no redness to be seen. No pains were taken to get rid of the offending matter; which, in all probability, was the cause of the disease. I did not know the use of bleeding, in this complaint, when I began practice; but I found it mentioned in authors. It seemed rational; and I adopted it in every case afterwards, where the pulse would allow it. In the chronic form, if you find any other disease present, you must endeavour to remove that. The urticaria may arise from chronic enteritis or gastritis; and that ought to be remedied in the usual way; which usual way is to apply leeches to the abdomen, or adopt general bleeding, &c. You may get great and deserved credit for curing this disease; or you may find it very obstinate. The secret of the cure generally lies in bleeding, and adopting antiphlogistic means. Among local applications, the chlorides, prussic acid, or nitric acid, best alleviate the itching.

RUBEOLA.

The next disease of which I shall speak (the measles) is a severe affection; — is frequently fatal. It is called, among the medical men of this country, *morbilli*, or *rubeola*. We have adopted the expression "*morbilli*" from the Italians; who so named the disease from its being a less kind of plague;—the "minor plague,"—the "little disease." The expression "*rubeola*" was formerly applied to scarlet fever and measles in common; as well as to other diseases. In fact, it was Sauvages (the first writer on Methodical Nosology) that restricted the term "*rubeola*" to *measles*. The word "*rubio*," from which it comes, is Spanish; and it was first written "*rubiólo*," as it is pronounced;—the accent being placed on the *o*.

This is a contagious and infectious disease. It chiefly affects children; and is more severe in them than in adults. There is very rarely an indisposition to it; for you seldom meet any one that will not take it. The indisposition is less frequent than the indisposition to small-pox. It rarely occurs more than once; but sometimes it does. Dr. Baillie, in the "Transactions of a Society for the Improvement of Medical and Chirurgical Knowledge," describes eight cases of its occurrence more than once. When it does occur more than once, it is generally when it prevails as an epidemic disease. By "epidemic," I do not mean *contagious*. The word "*epidemic*" has been attempted to be restricted to those diseases, which prevail over a number of persons, without any contagion in the atmosphere; but the word relates to diseases that prevail temporarily over many people, without a local cause,—be it contagious or not contagious. It is said that measles have been observed at birth. Hooping-cough, I mentioned, has been heard at birth. Children have been frequently born with the small-pox; and it is said that children have been born covered with measles. It chiefly prevails in winter and spring. It is very well characterized. It has very peculiar symptoms; and is a disease that hardly any one, I think, can mistake. It is almost always ushered in by catarrhal symptoms;—that is, by a

flushing of the face; redness of the eyes; heaviness of look; a "running" of the eyes and nose; soreness of the throat; sneezing; a hoarse and sounding cough;—a cough which old women, who have been much amongst children, describe as the "measle-cough." I cannot describe it. I can only say it is a *hoarse* cough.

These catarrhal symptoms will sometimes last *two* days, and sometimes *twenty*, before the cutaneous affection shews itself. But, in general, it is on the *fourth* day that it appears;—sometimes as early as the *third*, sometimes on the *fifth*, and sometimes on the *sixth*. It is generally upon the face that the cutaneous affection presents itself. It appears as a rash on the forehead and the chin; and thence it spreads all over the face. The next morning it is found to have spread, not only over the face, but over the breast and trunk, and upon the extremities. On the fifth day, the disease has pretty well covered the body; and it is on that day that the face is most vivid. On the sixth day, the eruption is pale on the face, and most vivid on the body; and on the seventh day, it begins to disappear in the latter situation. The disease altogether is of about seven days' duration. The catarrhal symptoms appear for four days; upon the fourth day the cutaneous disease appears; and this lasts three days;—making seven altogether. But, now and then, children have catarrh for two or three weeks; and then, in the midst of the catarrh, without any previous additional symptoms, except perhaps an increased intensity, the cutaneous disease shews itself. Now and then, on the back of the hand, there are patches, which did not appear before the sixth or seventh day of the fever; and in the remote parts of the body, the redness occasionally does not come on till that time; and then the eruption in these situations does not decline, perhaps, till the eighth day. On the ninth day, there is only a slight discolouration left;—a sort of brownish appearance. The colour, in this disease, is by no means so vivid as in roseola; and as in scarlet fever. When it is all over, if the inflammation have been pretty extensive, there is a furfuraceous desquamation. This, then, is the course of the disease.

When the affection first appears, there are only, at the utmost, little red dots, nearly circular. They are scarcely perceptible, and rather less than the spots of flea-bites. They become more and more numerous, however; and coalesce into patches. All the exanthemata begin and extend in this way. The patches which are formed in this disease, you must remember, are of an irregular figure; and frequently assume a semicircular or crescent form. This is characteristic of the disease, and is worthy of notice;—not that the diagnosis is often at all difficult; but if it *be* difficult, you may be assisted by remembering that the patches in measles affect a semicircular or crescent form; that, in the midst of these patches, there are circular spots; and that, around the patches, are spaces of the natural colour. Upon the face the disease is, of course, the most severe. The skin of the face is finer, and more abundant in red vessels, than

that of many other parts; and there it is that the effects of inflammation are most severe, from these circumstances. The skin is not smooth, but roughened; so that if you pass your finger along it, you will find a little roughness;—hardly worth the name of *roughness*, perhaps; but an *inequality*. Occasionally, if the inflammation be severe, this is observed in other parts of the body. Occasionally you will find the red dots more or less hard and elevated. Notwithstanding the disease is characterized by patches, the inflammation may be so intense as to cause the face to swell, and the eyes to be closed; nay, the symptoms may be so severe as to cause little collections of water, the size of millet seeds, which are called *miliary vesicles*; and sometimes there are papulæ on the hands, wrists, and fingers;—elevations of the cuticle, having a distinct roughness, in the midst of the patches; so that while the patches give to the feel a sensation of being elevated above from the surrounding skin, in the midst of these there will be another roughness, arising from the papulæ. When you hear a child sneeze and cough, and see these crescent-semicircular patches (represented in Plate xix), you may be sure it is the measles. It is on the face you usually see the disease best characterized. You may mistake it on the arms, hands, and body; but you can hardly do so on the face. It is very important to make a correct diagnosis here, although the disease may be of a slight character; because if you tell a parent that the child is about to have the small-pox, when it is going to have the measles, of course you will be thought no doctor. Sometimes the spots will go down as fast as they appear.

It is almost constantly observed, in this disease, that the cartarrhal symptoms are not much lessened on the appearance of the eruption. You will find it often said by authors, that when the eruption comes out in cutaneous diseases, the internal symptoms are relieved. We all meet with this occasionally; but in a great number of cutaneous diseases I have seen the internal symptoms not alleviated by the appearance of the external. In measles, however, it is a well-known fact, that so far from their being an alleviation of the internal symptoms, they are more frequently aggravated than not; at any rate, in general, they are not mitigated. When the eruption comes out, the catarrh is confined perhaps to the bronchia. It appears that the catarrh is more or less bronchitic; for there is an affection of the superior parts of those tubes. But frequently the irritation of that part of the membrane below the larynx increases, so that you have decided bronchitis. Sometimes you will have an affection of the substance of the lungs (peripneumonia); and sometimes of the investing membrane (pleuritis). Frequently, when the measles are over, they leave chronic bronchitis, chronic peripneumonia, chronic pleuritis, or even phthisis. They frequently seem to give rise to tubercles. Frequently, too, there is left after measles a chronic diarrhœa; which is generally of an inflammatory character; frequently inflammation of the eyes (ophthalmia); ear-ache; running of the ears (otorrhœa); deafness. Frequently there is disease of

the mesenteric glands; and frequently, after the disease, will come chronic cutaneous affections; such as ecthyma, rupia, porrigo, boils, aphthæ, and many other things. In fact, there is no end to the mischiefs that measles leave behind. They may recede suddenly; and then internal inflammation take place of the lungs, or within the abdomen, or in the head; but it is chiefly in the chest that inflammation occurs, when the disease recedes. It is not by any means certain, that the retrocession of the measles causes these symptoms. It is just as probable that, in many instances, the occurrence of the internal disease puts a stop to the external. It is a great mistake to suppose, that the retrocession of an eruption causes internal disease, in every case where such internal disease occurs. There can be no doubt that the occurrence of another disease, in the *internal* part of the body, will put a stop to, or suspend a disease, which has previously been going on in an *external* part; but it is a fact that, when measles suddenly disappear externally, for the most part there is some internal affection.

The treatment of the disease consists, in ordinary cases, of mild antiphlogistic diet and the other regimen. You must keep the patient cool; but not cold, lest you should induce bronchitis. You must keep him at a pleasant temperature. It was formerly the custom to keep children hot, lest the measles should go in; the consequence of which was, that it kept up an irritation of the whole system, and kept up any bronchitis that might be present. On the other hand, I should not aim at keeping the patient cold, lest there should be bronchitis induced in this way. An intermediate plan seems to answer best. Some have recommended cold affusion in this disease; but the tendency to bronchitis is such, that I have never practised it, and I would not recommend it.

From the catarrhal symptoms in this disease, and their great disposition, on the appearance of the eruption, to become severe, you will find it necessary always to direct your attention to the state of the chest. It is always necessary to observe, carefully, whether there is peripneumonia, or bronchitis, or pleuritis, or any other *itis* of the chest; and to treat it just as if no measles were present;—to take blood from the arm or the jugular vein, or apply leeches, just as you may think proper. One would not pay such great attention to these symptoms before the eruption occurs; but if they be severe when the eruption comes out, blood should be taken. Leeches generally answer; but if the child be large, you might take blood from the jugular vein, or the arm. Moderate purging is proper, and low diet. The patient must be treated on the antiphlogistic plan, according to the degree of inflammation. If the eruption does not come out, or recedes, you should put the patient into the warm bath; but you should remember that this is most likely produced by some internal disease; and that internal disease, in nine cases out of ten, is inflammatory; and in eight out of that nine it is situated in the chest. The best mode to bring out the measles, again, is to lessen the internal disease. The measles will sometimes be suspended

for many, many days, after appearing on the surface. They will recede in consequence of the internal inflammation; you must subdue that; and then, frequently, they will re-appear. This is a very curious circumstance. Now and then, there may not be internal inflammation. There may be mere debility; and then it is necessary to give stimulants;—ammonia and wine. When there is diarrhœa, it generally requires antiphlogistic treatment. The diarrhœa is generally troublesome, when the disease is over; but it is important, in all cases, to press upon the abdomen, and see if there be any tenderness. In a large number of cases, you will find tenderness; and the diarrhœa is only to be subdued by sinapisms, leeches, &c. Sydenham pointed out that the diarrhœa was inflammatory; that opium and opiates were improper; and that venesection ought to be resorted to. Venesection is out of the question, in many cases; but it is sometimes proper. However, this is no general rule. You see cases where there is so little inflammation, that astringents and opium will cure the disease; but frequently they are not to be trusted to alone. In some you must unite this plan with the remedies for inflammation; in others you must solely treat inflammation, and the diarrhœa will cease. This is a most important point in practice, although it is simple; and unless you carefully attend to it, you may do harm when good might be effected. The internal affection may be the consequence of the measles receding; but, in a great number of cases, it is the internal affection that puts a stop to the progress of the disease on the surface.

Infants, or at least children, are thought to be much more susceptible of the disease than adults; but infants at the breast are certainly not so susceptible of it as others. It is not at all an uncommon thing to notice the disease in a family of children; all of whom have it, excepting one which is at the breast. There is no doubt that *extreme* infancy is not so disposed to the disease, as *later periods* of infancy. It is considered, however, that infancy at large (childhood, and the young adult period) is more subject to it than the full adult period; and much more so than old age. In considering this question, we ought to reflect on the circumstance, that although fewer adults have it than children, yet it is a disease that occurs generally but once; and it is possible that the reason why it is not seen in adults is, that almost all adults have had it when children. That may be the reason. To ascertain the fact fully, we ought to have a number of adults who never had the disease; and expose them with an equal number of *children* who never had the disease; and see how many of each are affected. And still if a smaller number of adults escaped than of children, even that might not be satisfactory; because those adults probably did not have the disease in infancy, owing to a positive indisposition; and that indisposition might still prevent them from taking it. We can draw no inference from the number of persons who have the disease in childhood; as is usually the case. Dr. Babington, I have heard say, has seen measles occur after sixty years of age; and it is a fact that we may see small-pox

after seventy. Some children (as we before remarked) are said to have been born with measles; and others have had it at a very short period after birth; but, as a general rule, the extremes of age are very unfavourable to this affection.

The longer the premonitory symptoms and the general indisposition occur, before the appearance of the eruption, and the more severe they are, the more severe, generally speaking, is the disease itself. The affection too, is usually more severe in the *cold* than in the *warm* months. Sometimes, in the severe form of the disease, there are, about the fourth day, small dark patches in the mouth, on the hard and soft palate, upon the tonsils, and upon the uvula;—the mucous membrane being affected as well as the skin.

The exciting cause of the disease is, indisputably, a peculiar contagion; and this has been communicated by art;—the disease has been conveyed by inoculation. Experiments of this kind were made many years ago, by Dr. Home;—the father of the present Professor; and himself Professor of Materia Medica in the University of Edinburgh. You will find his experiments related in a work of his, called "Clinical Facts and Experiments," published in 1758. Many have thought but little of these experiments; but, in 1822, an Italian physician (Dr. Speranza) in the territory of Mantua, repeated them. He inoculated six cases, and afterwards himself, with the blood taken from a slight scratch in a vivid papula. In a few days the measles appeared; and went through their course mildly and regularly. This encouraged him to make further experiments; and he says they were all successful. Occasionally the measles do produce little vesicles; and it is certainly likely that these vesicles contain the contagious matter in a concentrated form. Many who have attempted to inoculate for measles have failed; but that measles *have* been communicated by inoculation, there can be no doubt; and as the disease, when produced naturally, is so severe; and when produced artificially, so slight; and as most children have the disease, I think it a pity the subject has not been more attended to. There is not the same facility of producing this disease, as small-pox; but it appears a possible thing to communicate it; and there can be no harm in scratching a few children, and attempting to give them the measles, during the favourable period of the year; nor I do not see why, as most children have it, they should not be exposed to the contagion, by having the clothes of others labouring under measles placed near them, during the warm summer months.

The measles are sometimes said to take place on the skin, without any internal affection;—without any catarrhal symptoms; without running of the eyes or nose; without sneezing, heaviness of the head, or cough; and it is said that when the disease occurs in this exceedingly mild form, it does not prevent a second attack. This was mentioned by Dr. Willan; and, as an accurate observer, he was perhaps never surpassed; but Rayer will have it that this kind of disease is not measles at all, but only roseola;—that simple slight blush of the skin, which I formerly shewed you. Dr. Willan, how-

ever, says that he saw two distinct cases of measles,—indisputable measles, without any catarrh; and I myself attended a family, in whom several of the children had had the measles, with catarrh; and one of them had, at the same time, an eruption exactly like the others; and which was pronounced, by the medical attendant, to be the measles. The rest of the family never had the disease again; but this one, a year afterwards, had regular measles. From this fact, occurring within my own knowledge, I cannot but think that Willan is right. If any one could distinguish between rubeola and roseola, it must have been Dr. Willan. Besides, all contagious diseases will occur in an imperfect form. The most intense contagious disease may be of unusual shortness, or of unusual mildness, or both; and may even want some of its symptoms. Small-pox pustules sometimes occur without any indisposition. Doubtless, measles is no exception to the general truth. When small-pox has so appeared, Willan says it may begin regularly, and be perfected on the eighth or ninth day from the first appearance of the pustules, *without indisposition.* In the same manner, measles will sometimes appear, and proceed to perfection in a few days after the eruption, *without catarrh.*

The measles are sometimes attended with a darkness of the skin. About the seventh or eighth day, the rash suddenly becomes yellow, or livid. There is languor and quickness of the pulse; but no inconvenience arises; and the whole ceases in a week or two. It does not appear that there is any danger, from the mere lividness of the patches in this disease. Many eruptions of the skin, when they subside, become of a dingy or yellow colour, and without any danger whatever. There is merely a little change of colour, which is quite independent of the present indisposition. So it happens in measles. The dinginess is more intense than usual; the part becomes exceedingly brown and yellow; but this generally ceases after a week or two. Perhaps the blood is in a state approaching to stagnation;—the circulation not going on in the natural way. This is called "rubeola *nigra.*" But it is said that measles sometimes do occur in a really typhoid state of the body;—that "putrid measles" do take place. Sir William Watson, who was physician to the Foundling Hospital, said that he saw this sixty years ago. Others think this was an error; because (like Morton, a cotemporary of Sydenham) he did not distinguish measles from scarlatina; and proposed to banish the latter word as superfluous. Indeed, the original writers on measles all consider it and small-pox as the same disease, in different forms. However, Dr. A. T. Thomson declares, that he saw a case in 1804, where the languor and state of the pulse were alarming; and the skin rubbed off like a moist cobweb; but the patient recovered by the use of wine and cordials. I never saw this form; but the other (rubeola nigra) is not very uncommon.

In Plate xx, you will see a representation of measles without catarrh; which is said not to give impunity from the disease afterwards. Still I see nothing peculiar in the eruption. You observe that there are patches of a semicircular form. If a child have

measles without catarrhal symptoms, it is well to tell the parents that it may have an attack again. If you do not adopt this method, the family will say, "Mr. So-and-So said the child had the measles; but it never had; or it would not have them now." It is therefore well to save your character. A second attack of measles is possible, in any circumstances; but if they occur without catarrh, it is almost certain that the patient will have them again. In Plate xxi, there is a representation of the dark-coloured measles; which Willan calls "rubeola nigra."

With regard to the time at which the disease occurs after exposure, Willan says that he knew a person who had had the measles, and became convalescent; and his clothes infected a child in the country; and that the child had the eruption sixteen days after being first exposed. I suppose the usual period is from five days to a fortnight; but most probably this varies, as in most other contagious diseases.

With respect to the treatment of measles, the first point is to attend to any internal symptoms of inflammation that may exist. A large number of cases will do very well, without any medicine at all. The child cannot eat; and therefore, if not recommended by the parent, it will not take any thing to do it harm. It is more inclined to take plain water, milk, or milk and water, than any thing else. It is right that the patient should be kept *cool*; but it is rather dangerous to keep it *cold*. It should be kept in a *moderate*, but by no means in a *stimulating* temperature; for heat would do great harm, and aggravate any disposition to bronchitis; but I do not know that there would be the same propriety in exposing the child to cold air, that there is in small-pox and scarlet fever; owing to the great disposition to bronchitis. I do not think it would be right to bleed, generally or locally, to *prevent* bronchitis. It is time enough to bleed when the bronchitis begins. If the child be young, the moment there are symptoms of an inflammatory affection of the chest, you should apply leeches; but if the child be old, you should bleed from the jugular vein, or the arm. There is nothing more easy than to take blood from the jugular vein; unless the child be too fat. The treatment should be that of bronchitis. If the disease continue, you must look out for local inflammation; and if that local inflammation cause the eruption to disappear, and you can subdue it, then the eruption will return. The warm bath will be useful; and it can do no harm. Scarcely any affection occurs in a child, in which the warm bath is not of use.

The diarrhœa after measles, is generally of an inflammatory character; and is best treated by the application of blisters; or of a sinapism, if the child be too young for a blister. Blisters are very dangerous things to employ, in the case of very young children. I should prefer the application of a sinapism; because it is taken off in a moment; and great external irritation is quickly produced, and may be regulated at pleasure. It is not improper to give astringents, in the diarrhœa that follows measles; but you must look out for local inflammation; and if that exist, you must combine the astringents

with the proper remedies for inflammation; or employ the remedies of inflammation only. Measles are very apt to leave after them an obstinate diarrhœa, which ends in disease of the mesenteric glands; and a bronchitis, that is apt to leave a disposition to the formation of tubercles. You have chronic bronchitis, and then tubercles; so that children frequently die of phthisis; but measles often set up scrofula, both in the abdomen and chest. I need not say that, in the putrid form of measles, (which I have never witnessed), the opposite plan must be adopted; only we must take care not to mistake a blackness from bronchitis (from extreme congestion in the lungs), for a putrescent state of the body. When there is congestion of the head and chest, wine and tonics would be exceedingly improper; but I should think that a careful practitioner would not make the mistake to which I have adverted.

SCARLATINA.

The next disease among the rashes, of which I will speak, is scarlet fever; which is called, in medical Latin, *scarlatina.* Till the close of the eighteenth century, this disease was confounded with measles. Morton, who (as I have just told you) was a contemporary of Sydenham, thought they were mere varieties of the same disease.* In the middle of the seventeenth century, Sennertus asks why the disease is sometimes *small-pox*, and sometimes *measles*;† and Diemerbroeck, who published in 1687, asserts that measles and small-pox differ only in degree.‡ Such were those days of diagnosis. In 1769, Sir William Watson did not distinguish measles from scarlet fever.§ On this account, you heard, some have affirmed that Sir William did not see the putrid form of measles;—that what he saw was putrid *scarlet fever*; and that, as he did not distinguish between the two affections, he called it *measles.* Indeed Morton, who confounded the disease, wished the appellation "scarlet fever" to be banished altogether. He conceived that the two diseases (measles and scarlet fever) were but one; and he thought it a pity to use both terms; the word "measles" being quite sufficient to designate the whole disease. Bateman thinks that the year 1793, was the first in which an accurate diagnosis was made. Dr. Withering published an essay on Scarlet Fever, in 1788; of which essay the second edition appeared in 1793;‖ and Dr. Bateman considers, that the latter was the accurate date of the first correct division of these diseases. This must appear to us strange; now that the diagnosis between the two diseases is established with the most perfect facility. But so it is; and I

* "Opera Medica; nimirum, de Phthisi; de Morbis universalibus acutis; de Febribus inflammatoriis. Auctore R. Morton, M.D."

† "Opera Omnia;" 3 tom. folio. Paris, 1641.

‡ "Opera Omnia Anatomica et Medica, Isbrandi Von; emendata et aucta ab auctore; et recognita per Inn. de Diemerbroeck (Isbrandi filium)." Folio. Ultraj. 1685.

§ "An Account of Experiments on the Inoculation of Small-pox. By William Watson, M.D."

‖ "Account of the Scarlet-Fever and Sore Throat; by William Withering, M.D."

trust that those who live a hundred years after us, will be satisfied that we were an ignorant set;—that science will so advance, that hereafter our knowledge will appear perfect ignorance. You see that, at the present moment, people cannot settle how long cholera has existed;—whether it is a new disease or an old one. Some say that it sprung up a few years ago; and others assert that it has been known from time immemorial. It is just the same with scarlet fever. Some say that it was not known more than two hundred years ago; that it is not mentioned in the Arabian, not to say the Greek, writers; and that it came from Africa, and broke out, for the first time, in Europe, in Spain, in 1610. Willan says it was known to the Neapolitans, before 1500, under the name of *rossalia*, or *rossallia;* and that Ingrassia describes it under that name; that others called it *rosalia*, *robelia*, *rubiola*, *rubeola*, *rubeolæ*, *rubeoli* (from *robia*, madder; and *morbilli*, measles); and that the French used all these words for scarlatina; and in addition even *rugeole*;—terming measles *senession*. The word "*scarlatina*" was formerly "*scarlattina*;" and is derived from *scarlatta*,—"a red-coloured cloth."

This disease is characterised by a close and diffuse efflorescence of the skin; of a high scarlet colour; and affecting likewise the mouth and fauces. There are the usual symptoms of pyrexia, for about two days; and the second day of the pyrexia, generally, the eruption appears in some part. In the greater number of cases, I believe this is true; but occasionally the eruption will not take place till the third, fourth, fifth, or sixth day; and when the eruption does take place, it continues about five days. Scarlet fever arises solely from contagion. I use the word "*contagion*" in a generic sense. It is a disease that usually occurs but once during life; but I believe the exceptions to this rule are more frequent, than in the case of small-pox. Small-pox occurs twice, more frequently than measles; and I believe scarlet fever occurs twice, more frequently than small-pox; but I am not certain; for some persons do not make a sufficiently accurate diagnosis, between such a rash as roseola and scarlet fever. Still, however, it is by no means uncommon for persons that have had scarlet fever, to have a sore throat; if they be exposed to the infection of an individual labouring under this disease. It is by no means unusual for those who have about them children labouring under scarlet fever, to have a sore throat, characterized by intense redness; and that sore throat is sometimes very severe. Occasionally, persons who have had it formerly, or are recovering from it, have not only sore throat, (if strongly exposed to the contagion), but even spots like flea-bites, sometimes of a dark colour. Being of this infectious nature, the disease is often epidemic; but it is more prevalent at the equinoxes, than at any other period of the year. It occurs more frequently in children than in others; but the extreme of infancy is least liable to it; just as it is least liable to the measles. It differs, however, from measles and small-pox in this;—that persons generally are not so liable to it. Almost every body has the small-pox, unless they have had the cow-pock, and are thus prevented; but you will find a great number of persons that never had scarlet fever. It is

common to find persons that never had the scarlet fever; although they have been exposed to the contagion; but it is very uncommon to find persons that have not had the small-pox (or the cow-pock) and measles. I have been exposed to the scarlet fever often enough; but I never had it; though I have had small-pox, measles, and hooping-cough; and the rest of the diseases which people usually have. Dr. Willan says, that he never saw the disease occur more than once; although he had witnessed two thousand cases of it. When I was a pupil, it was denied that small-pox or measles ever occurred twice; but now that there are so many persons capable of making good observation, cases have been sufficiently multiplied to settle that point.

The period at which the disease usually takes place, is three, four, or five days after exposure; but the interval between exposure and the appearance of the affection, is greater in adults than in children. The disease may be caught by being near a person labouring under it; and therefore it is infectious. It may be caught, too, by touching any thing that the individual has touched; and it may be caught from a second person. If an individual visits a person labouring under the disease, and then visits another, the second person visited may catch it from him. It may be communicated too, it is said, by the exfoliated portions of cuticle. One must conceive that these are abundantly impregnated with the perspiration, and therefore that they will communicate the disease; but I do not know myself, from observation, whether this is the case.

In the most simple form of the disease (that called "scarlatina *simplex*") the feverishness is very moderate. On the day after the commencement of the feverishness, innumerable red spots appear on the face and neck; and these, in twenty-four hours, will spread all over the surface;—coalescing and multiplying. They thus increase and multiply; enlarging the redness, and uniting together; till they form large extensive patches over the trunk and extremities. On the third day, there is almost one diffuse and continuous efflorescence over the body; and especially around the fingers. The scarlet hue is usually most vivid on the flexures of the joints;—the skin there being very fine; and likewise on the loins. The patches are seldom universal on the trunk; but upon the extremities they are very continuous;—run to a great length. If you turn aside the bed-clothes, you perhaps observe a continuous redness from the groin down to the foot;—the patient looking almost like a boiled lobster; and towards evening the redness is so intense, that the patient looks as if he had been smeared with raspberry-juice. Some lobsters are redder than others; and the colour at evening is like that of a very red lobster, or a skin smeared with raspberry-juice. On passing your finger carefully over the skin, you may find minute roughnesses;—asperities exceedingly minute;—far more so than you observe in measles; but you do not observe the irregularity that occurs in measles. In measles, you find the whole skin raised in patches; and, besides that, you frequently feel small papulæ; but in scarlet fever you do not find the patches at all elevated. You do not find continuous

elevations; but you may, with the point of the finger, discover exceedingly minute asperities. The distinction between the sensations given to the touch, in the two diseases, is very obvious. In measles (as I have just said) the patches are more or less elevated; and you may feel in the midst of some of them, little papulæ; but in scarlet fever you will not find the patches elevated above the rest of the skin; and, instead of finding little papulæ, you find only the most minute possible asperities;—resembling the "cutis anserina" of the cold stage of ague; and it is only upon the breast and extremities that you can find these, in scarlet fever.

It is usually upon the fourth day, that the eruption is at its height. On the second it comes out; on the third it has spread all over the surface; and if the lower parts were exempt before, it reaches them now; and is at its height of redness. On the fifth day it declines; and it declines by interstices; so that the patches re-appear. While the disease was increasing, the patches were lost in one continuous redness; and then, as the disease declines, the continuous redness becomes again divided into patches;—that is to say, there are intervals of paleness. On the sixth day, the eruption becomes very indistinct; and it is gone, generally, before the end of the seventh. Now and then, if the disease be severe, (and sometimes when it is not), between the fourth and seventh day there are (as is sometimes observed in measles) little miliary vesicles. In acute rheumatism, I have seen the fingers beset with vesicles; and the same occurrence takes place in measles, and sometimes in scarlet fever. About the eighth or ninth day, the cuticle comes off; in the form of scurfy desquamation.

The disease attacks the interior of the mouth and fauces; and it even affects the conjunctiva. The papillæ of the tongue become enlarged; and you may see them through the white crust with which it is loaded. The tongue looks as if it had been slightly sprinkled with Cayenne pepper. There is a dry mucus on the tongue; through which are seen peeping these red points. If there be any cough in the disease, it is not that peculiar cough which I mentioned as occurring in measles. In measles, there is a peculiarly sounding cough; such as sharp women and nurses know very well to be the cough of measles; but that does not occur in scarlet fever. If there be any cough at all, it is merely a short irritating cough; a cough merely from irritation of the fauces, without any expectoration or hoarseness. From the conjunctiva being affected, there is a redness of the eyes; but no intolerance of light, and no overflowing of the tears; and the ciliary glands are not affected.

If scarlatina be at all severe, you may have a discharge from the ears, both within and without;—a discharge both from the Eustachian tube, and the external meatus. It may also give rise to sore ears;—to glandular suppurations in various parts; as in the parotids, and in the glands of the neck. It may give rise to pulmonary disease, or to diarrhœa. It may be followed by chronic pustular diseases of the skin; called rupia and ecthyma; but they are much more common

after small-pox. After mild scarlet fever, there is very often general dropsy;—anasarca. The other symptoms which I mentioned (such as discharge from the ears, suppuration of the glands, &c.) all occur after the most *severe* forms of the disease; particularly that called "scarlatina *maligna*;" but after the *mildest* form you may have dropsy. This dropsy usually occurs at the end of the second week; and after the rash declines. It occurs particularly in spring and in autumn; and, if I be not very much mistaken, it is generally owing to the patient having caught cold, in some way or other. In the plate I now shew you (xxii.) there is a representation of "scarlatina simplex;" in which you observe continuous patches and asperities; or a very minute roughness in the skin.

If the throat be affected in a very marked manner, the disease is called "scarlatina *anginosa*." You now and then have the disease, with little or no affection of the throat. Perhaps there may be a slight affection; though frequently it is so slight, as to deserve no notice; but if it be very obvious, the disease is called "scarlatina anginosa." There is then more violent inflammation of the fauces; which inflammation increases and decreases with the eruption; the general disease of the system, and the eruption, are altogether more intense. The heat may be 106 or even 112 degrees; and there is sickness, headache, restlessness, and delirium. The throat feels sore and straightened; and, on inspection, in various instances, a dark red line is seen along the velum, reaching down to the lower part of the uvula. The patient is hoarse; experiences a difficulty in swallowing; and the tongue is very red, especially at the sides and the extremity. The papillæ are particularly affected; so that they are greatly increased in length. In this more severe form of the disease, the eruption often does not appear till the third day; and very often the eruption is not so universal, but is in scattered patches; and very often it does not come out fully and remain so, but appears and disappears. Thus the whole disease is lengthened. From the eruption not coming out permanently, the disease is protracted. I mentioned that when the measles recede,—when they come out and go back again, the eruption may last for some weeks. So in scarlet fever, if the disease comes and goes, then the period of the eruption is increased; although I do not know that it can be increased to the period, to which I have seen measles extend. When the disease thus goes off, the desquamation is less regular; and, if the rash have been slight, (as it sometimes is, even when the throat is much affected), there is perhaps no desquamation at all. Sometimes we see exfoliations of large portions of the skin, for many weeks; and these are usually upon the hands and feet. The nails have been known to crack and separate; and now and then superficial ulceration will take place on the tonsils. For the most part, there are shreds of viscid secretion; which are sometimes mistaken for sloughs; but they are merely vitiated secretions;—excessively thick portions of lymph. Now and then you have real sloughs; with great debility after the disease.

But we have another form of the affection, in which there is a great disposition to sloughing, to mortification of the throat, and to putrescency of the body; and this is called "scarlatina *maligna*." The distinctions of this disease are very proper; but you have only to remember that there is a mild form of the disease; another in which the throat is much affected; and another where there are typhoid symptoms. With respect to scarlet fever, the names of the species are not unworthy of being remembered; as is the case in many other cutaneous affections. In this violent typhoid form of the disease, the efflorescence is dark and livid. It comes out even still later than in "scarlatina *anginosa*;" where the disease is attended by an inflammatory sore throat; and it is of uncertain duration. It is continually going and returning; and there is less heat of the body. In "scarlatina *anginosa*," I said the heat might be 112 degrees; but here there is less heat; and the pulse, although perhaps very quick, is languid. There is great affection of the head;—great delirium or coma. In fact there is encephalitis;—inflammation within the head; and sometimes there is other inflammation present. The eyes are red; and the cheeks are darkly flushed. There are sordes of the tongue and mouth; dark sloughs (the bases of which are livid) in the throat; and great fœtor from the nose and mouth. There is an acrid discharge through the nostrils;—a discharge which irritates the skin upon which it comes. There is diarrhœa; and frequently there are petechiæ;—black specks on the surface of the body. Hæmorrhage occurs; and death often takes place in two or three weeks. Sometimes the patient sinks suddenly, within the first four days. Occasionally the disease does not shew this malignant character at first; but goes on pretty mildly; and then, all at once, puts on these malignant symptoms. When the body is inspected, there are found to be various internal congestions, inflammations, and effusions; and inflammation of the surface (not of the *interior*) of the skin.

It is this frightful form of the disease which, when recovered from, leaves such severe complaints; as ulceration within the ears, chronic diarrhœa, and such diseases of the skin as rupia and ecthyma. I do not know that this form of the disease is more frequently followed by anasarca than the others. So comparatively rare, however, is this species of the affection, that I have never yet had occasion to treat a patient with it. It is, perhaps, a singular thing, that I never yet lost but two patients with scarlet fever. But it has solely arisen from this circumstance;—that they have always been *mild* cases which I have treated;—such cases as required cold washing, cold air, and occasionally the local application of leeches. I have heard other practitioners say, that they never lost a case of scarlet fever. Luckily the disease does not put on this severe malignant form, except in rare cases.

We sometimes see that form of the disease which is called "scarlatina maligna," occurring generally throughout a neighbourhood;—at least generally during an epidemic. Sometimes we see one person in a neighbourhood affected with it; while other persons, or

other children, are affected with other forms of the disease. Sometimes, even in the same house, you will see all the three forms of the disease. It appears, therefore, that the cause of the disease putting on this malignant character, is sometimes something general in the state of the season or place; and sometimes something altogether dependent upon the condition of the individual. It does not appear to be any thing peculiar in the contagion. We shall find, in the case of small-pox, that matter taken from a person labouring under a mild variety, will sometimes give to another person a malignant, confluent, violent form of the disease. So, in scarlet fever, the *mild* form of the disease, is sometimes caught from a person labouring under a *malignant* form; and *vice versâ*; and although we see numerous cases of malignant scarlatina, during a particular epidemic, and especially in a particular neighbourhood; yet, at other times, we shall see the malignant form occur sporadically. It may occur only in one or two individuals in a neighbourhood; while the rest have the mild, or merely the inflammatory form; and we even sometimes see this peculiarity cease in one place, while another becomes filled with the inflammatory or mild form. I believe that the malignant form is more common in winter, than at any other period. The circumstances that give rise to it are not well known.

There is, however, another form of the disease; in which the *throat* is affected, and not the *surface*. Some, indeed, have denied this; just as some have denied that measles are occasionally seen without catarrh. As, however, this disease affects both the surface and the throat; and as some have asserted that it frequently affects the surface, while there is little or no affection of the throat; so there is no reason whatever why the throat should sometimes not be sore, while the surface is scarcely or not at all affected;—while there is nothing upon the surface worthy of the name of an eruption. Dr. Willan mentions that, in epidemic scarlatina, there are always many cases where the throat only is affected; and that these cases will communicate all forms of the disease, just as if the skin were affected. This, I think, is not at all surprising. In that form in which the throat particularly suffers, if we were to look over the skin from head to foot, two or three successive days, we might perhaps discover an eruption; but it would be so little, that we should be almost justified in saying there was none; and I have seen several in a family affected with the sore throat only; and that mildly. Those who formerly had scarlet fever, and even those that are recovering from it (those who are convalescent,—only just getting strong) if they be exposed to the contagion again, will sometimes have a little soreness of the throat, and even patches on the skin.

The treatment of this disease is, for the most part, very simple. If you take care to do the patient no harm, he in general will do very well. In this disease, cleanliness and fresh air should be particularly attended to. If the season will allow it, the windows and doors should be opened; and only the slightest covering placed upon

the patient. Cold drinks, and water (or something nearly as simple as water) are the most eligible. No food beyond this, except it be milk and water, should be allowed. The bowels, of course, should be kept open. It is said that you alleviate the disease, if an emetic be given early in it. Some are of a different opinion; but many contend that, at the beginning of the disease, it is very good. The disease certainly has been cut short, by taking a patient out of bed, and pouring cold water upon him. The heat of the body is so great, in this disease, that no danger is to be apprehended from cold affusion. It is true, there are cases in which the patient is more or less chilly; but if, in this affection, the general rules which I laid down in the case of common fever be followed, there is no danger whatever, but the greatest advantage, in taking the patient out of bed (however hot he may be) and pouring cold water upon him. Those rules, you remember, are that the temperature is steadily above 98 degrees; that there are no profuse general sweats; and that there is no sense of chilliness; and no inflammation of the chest or abdomen. I presume this would be done oftener than it is, were it not for its appearing a violent measure, to take a person, with fever, out of bed; put him into a washing-tub; and souse him well with cold water. But, at any rate, no friends will object to your washing a patient with cold water. It is a great comfort to the individual; and as long as it is comfortable, it should be had recourse to. Sponging the hands, arms, face, and trunk, with cold water, is grateful to the patient; and is an excellent practice in the disease.

If the inflammatory symptoms run high, of course it will be necessary to bleed in the arm. In general, it is only requisite to give the patient fresh air; to give him little better than water to drink, and nothing to eat; to keep him clean; to let him have but few clothes upon him; and to keep his bowels open. But if the symptoms should be violent;—that is to say, if any local inflammation come on in the head, chest, or abdomen;—it may be necessary to take blood from the arm. You will recollect I mentioned that, in this disease, very violent phrenitis will sometimes come on. You are not to neglect local inflammation, because the affection under which the patient labours is scarlet fever. For the most part this inflammation may be subdued by local bleeding; and it is best to remove it by that means, if you can; because you produce less debility, than if you take blood from the arm with a sudden shock. It is to be remembered, however, that the case may be so severe, as to render general bleeding imperative.

The chief parts that suffer, in this disease, are the throat and head. The throat suffers, because it is one of the seats of the disease. The application of leeches around it, is exceedingly useful;—far better than a blister; as I shall mention when I come to speak of common sore-throat. In that affection, blisters are frequently very severe; but leeches afford immediate relief; and plenty of leeches about the throat, or about the head, are often valuable in scarlet fever. You may see the tongue particularly foul in this dis-

ease; and that might make you imagine that there was great disturbance of the digestive organs; and therefore that emetics, calomel, and things of that description, were particularly necessary. But this, I think, is a wrong inference; for the tongue is one of the seats of the disease. It is not foul because there is intense feverishness of the system; but foul because it is in a state of inflammation. It is, as I have said, one of the parts which the disease affects. You see the papillæ exceedingly red; the tip is red; and the secretion on the back of the tongue is diseased, both in quantity and quality. You may have, in fact, (besides the redness of the papillæ), just such a tongue, with respect to the dorsum, that you have when a person is fully under the influence of mercury;—a tongue covered with a thick, yellow mucus. The tongue itself is swollen.

You will find the state of the mouth much alleviated, by allowing the patient cold drinks; or, if it be agreeable, he may have them iced; for the heat of the throat and mouth is very great. You will continually see sloughs formed upon the throat. I believe I mentioned that it is not every thing which *looks* like a slough, that *is* one; because the disease produces the effusion of shreds of lymph; and they lie there as though it were a little ulcer; but occasionally you have dark and ash-coloured specks, which you find cannot be easily removed; and which are neither more nor less than so many sloughs. In the malignant form you have very considerable sloughs. These, whether they be mere shreds of lymph, or sloughs, are always best treated by gargles of the chloride of soda or lime. The more intense the gangrenous tendency, the stronger must be the gargle. In ordinary cases of scarlatina, a gargle composed of two ounces of the common solution, to half a pint of water, is found strong enough. It will produce a pricking sensation, and is even sometimes too strong; but in other cases, where the sloughs are very considerable, you may employ it much stronger than this. In the merest specks of the throat, you find this one of the best applications that can be employed. However, you frequently find a difficulty in the application of gargles; and then it is better to use a syringe, and squirt the gargle at the throat; if any of it be swallowed, it is a good internal medicine, and will do no harm. I know no gargle to be compared with a diluted solution of chloride of soda or lime; both in cases of scarlet fever, and in cases of thrush.

If the disease shew a very considerable gangrenous tendency in the throat, and the pulse be very soft and feeble, you have only to treat it, generally, as you would treat any case of typhus fever. Among the internal stimulating medicines, which it is found necessary to give in the latter stages, carbonate of ammonia is the best; with the exception, perhaps, of wine; which generally answers better than any thing else. Patients will sometimes take a great quantity of wine, in this disease. Dr. Withering, who wrote on this disease, says that, in an epidemic which prevailed among a number of children, (about twelve years before he wrote), each must have taken a bottle of the best port wine in twenty-four hours, for

several successive days. A quantity of wine is borne, on these occasions, which would intoxicate and destroy at other periods. The treatment is the same as for typhus fever, where there is great debility, or a tendency to putrescency, or mortification.

Some persons think that ammonia has a peculiar power in the disease; and they say they have given it in every case of every description, whether inflammatory or not; and that they never lost a case in their lives. I presume that very few of the cases which these gentlemen treated, were of a malignant character; and that if they had merely given all the children a piece of *sugar* once in the twenty-four hours, still the greater number would have done almost as well. This is a disease which, for the most part, terminates favourably, if the practitioner does no harm; and a little ammonia can do none; but, by rational treatment, you make it run its course mildly; and save the patient a great deal of suffering. If the eruption recede, the best treatment is to put the patient into a hot bath, several times a day; to rub the body with stimulants; and to give stimuli internally. But it is necessary here, as in other similar cases, to observe whether an internal inflammation has come on. It may be *that* which prevents the patches from coming out; and in such a case you must be careful not to give internal stimuli. You would then apply leeches, to remove the internal congestion and inflammation. You may stimulate the surface at the same time; but the great point is to alleviate the *internal* affection, which prevents the *external*.

As this is a disease which children do not *necessarily* take, as they do measles and small-pox, it is but fair to endeavour to prevent them from catching it; and, besides free ventilation and cleanliness in the house, the use of the chlorides may be proper, with a view of destroying the contagion. I do not know whether they *do* destroy contagion; because I have recourse to fresh air, plenty of water, and cleanliness; and as I feel it my duty to use the chlorides at the same time, it is impossible to say what is done by the one, and what by the other. I have no means, therefore, of drawing a conclusion. But it would be well to throw the dirty linen, taken off a patient, into water in which the chlorides have been introduced; to put the chlorides into various utensils which are used; and to sprinkle them about the room. In this way, you may possibly prevent other persons in the house from catching the disease.

There is, however, a medicine recommended by a German physician, for the purpose of preventing the disease, which appears to me, of a very fanciful character. Dr. Hahnemann, of Leipsic, says that belladonna will prevent the disease. He says, that if you take two grains of the extract of belladonna, and dissolve them in one ounce of cinnamon-water, or pure water, (which is much the same thing), and give two minims of this solution to a child a year old, (or another minim or two, according to the age of the child), you may prevent the disease. I never thought it worth while to try it; because I hardly think the observations which are published conclusive. I know that foreign physicians have since published accounts of the

disease being so prevented; but it ought to be from hundreds of observations, that any one says the disease has been prevented; because it is an affection that will not attack every one in a house; and every now and then, when the disease has been spreading for some weeks, all at once it will disappear, and no other person have it. Inferences, therefore, ought not to be drawn without very numerous facts;—numerous coincidences, well ascertained.

With regard to the anasarca which follows this disease, I have no doubt that it frequently arises from cold; for it either begins in the face, or the face is affected as soon as any other part. It may be attributable to exposure to cold when the disease is over, or declining; because it is an affection that does not take place *during* the disease, but *subsequently* to it. Rayer condemns the application of cold in the disease; because it is likely to produce anasarca. Now I have generally used cold ablution, not *affusion*, in this disease; and I never had a case of anasarca, which occurred when I had treated the disease myself. I do not believe that, if low temperature be applied properly (that is to say, when the heat of the body is too great) there is any danger of the patient catching cold; but if it be used when the patient is not hotter than he should be, or after the disease has declined, then I have no doubt that it would lead to anasarca. However, this anasarca appears to be inflammatory; and for this reason it resembles the anasarca which is the effect of exposure to cold;—especially cold united with wet. It begins in the face; or it particularly affects the face; or it is seen in the face as soon as any where; and, in the next place, the urine is often albuminous. It will not merely contain *albumen*, however, but sometimes *blood*. In most cases of anasarca which I have seen, (and perhaps I have seen them only because they were intense), there has been more or less internal inflammation, in the head, chest, or abdomen;—just as in acute anasarca from cold. In almost every case, it was in the chest; generally peripneumonia or pleuritis.

The treatment of this anasarca is best conducted by antiphlogistic means;—by purging the patient well (which is an antiphlogistic remedy); and some say by giving digitalis; but I know that it recedes best by purging; and by attending to any internal inflammation that may exist. It would be in vain to purge, in severe inflammation of the chest, unless you made use of leeches at the same time; and the same remark applies to the head. It is important, in all these cases of anasarca supervening on scarlatina, to examine whether there be inflammation; for if you neglect that, the anasarca will generally be tiresome; but if you treat that, it will go away. Occasionally the anasarca goes away of itself; but you may always expedite it by purging, or by briskly applying antiphlogistic measures, directed towards some internal part. I do not know whether it is mentioned by any author; but, besides phrenitis or arachnitis, rheumatism is not an uncommon sequela of scarlatina.

Author Ellis Tan, John 67991 WB 25
Title Practice of Medicine I

University of Toronto
Library

DO NOT
REMOVE
THE
CARD
FROM
THIS
POCKET

Acme Library Card Pocket
Under Pat. "Ref. Index File"
Made by LIBRARY BUREAU